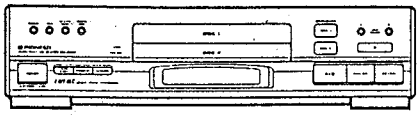
4059

PIONEER®
The Art of Entertainment

Service Manual



ORDER NO.
ARP2399

TWIN–TRAY COMPACT DISC PLAYER

PD-J500T
PD-J400T

PD–J500T AND PD–J400T HAVE THE FOLLOWING:

Type	Model		Power Requirement	Remarks
	PD–J500T	PD–J400T		
HEMXJS	○	○	AC220V–230V, 240V (Switchable) *	
HBXJS	○	○	AC220V–230V, 240V (Switchable) *	
HPW	–	○	AC220V–230V, 240V (Switchable) *	
SD	○	○	AC110V, 120V–127V, 220V, 240V (Switchable)	

* Change the connection of the power transformer's primary wiring.

- **This manual is applicable to PD–J500T/HEMXJS, HBXJS, SD and PD–J400T/HEMXJS, HBXJS, HPW, SD types.**
- **As to PD–J500T/HBXJS, SD and PD–J400T/HEMXJS, HBXJS, HPW, SD types, refer to page 61.**
- **Ce manuel pour le service comprend les explications de réglage en français.**
- **Este manual de servicio trata del método ajuste escrito en español.**

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4059

1. SAFETY INFORMATION

(FOR EUROPEAN MODEL ONLY)

VARO!
AVATTAESSA JA SUOJALUKITUS OHITETTAESSA OLET ALTTIINA NÄKYMÄTTÖMÄLLE LASERSÄTEILYLLE. ÄLÄ KATSO SÄTEESEEN.

ADVERSEL:
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION UNDGÅ UDSAETTELSE FOR STRÅLING.

VARNING!
OSYNLIG LASERSTRÅLNING NÄR DENNA DEL ÄR ÖPPNAD OCH SPÄRREN ÄR URKOPPLAD. BETRAKTA EJ STRÅLEN.

LASER
Kuva 1
Lasersateilyn
varoitusmerkki

WARNING!
DEVICE INCLUDES LASER DIODE WHICH EMITS INVISIBLE INFRARED RADIATION WHICH IS DANGEROUS TO EYES. THERE IS A WARNING SIGN ACCORDING TO PICTURE 1 INSIDE THE DEVICE CLOSE TO THE LASER DIODE.

IMPORTANT
THIS PIONEER APPARATUS CONTAINS LASER OF CLASS 1.
SERVICING OPERATION OF THE APPARATUS SHOULD BE DONE BY A SPECIALLY INSTRUCTED PERSON.

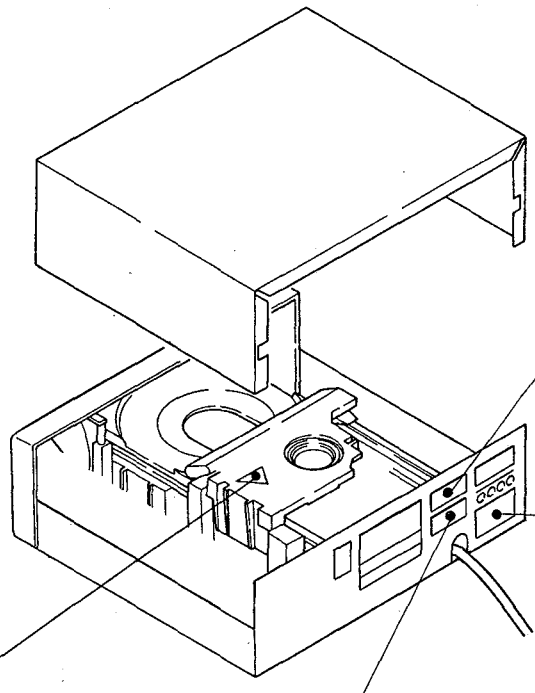
LASER DIODE CHARACTERISTICS
MAXIMUM OUTPUT POWER: 5 mw
WAVELENGTH: 780-785 nm

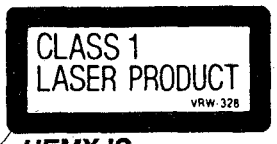
LASER
Picture 1
Warning sign for
laser radiation

LABEL CHECK (TWIN type)

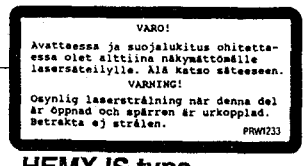
Additional Laser Caution

1. Laser Interlock Mechanism
   The ON/OFF (ON : low level/OFF : high level) status of the U (S601) and L (S603) switches for detecting the disc clamp state is detected by the system *microprocessor*, and the design prevents laser diode oscillation when both switches U and L are OFF (high level).
   Thus, the interlock will no longer function if switches U (S601) and L (S603) are deliberately shorted.
   Laser diode oscillation will continue if pins 2 and 3 of CXA1471S (IC101) are connected to ground or pin 20 is connected to high level (ON) or the terminals of Q101 are shorted to each other (fault condition).
2. When the cover is opened, close viewing of the objective lens with the naked eye will cause exposure to a Class 1 laser beam.



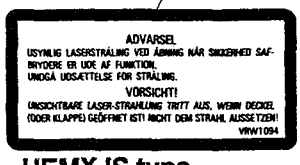


**HEMXJS,
HBXJS types**


VARO!
Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING!
Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.
PRW1233

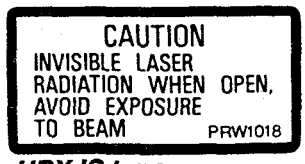
HEMXJS type

**HEMXJS,
HBXJS types**


ADVARSEL
USYNLIG LASERSTRÅLING VED ÅBNING NÅR SIKKERHED SAFBRYDERE ER UDE AF FUNKTION, UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT!
UNSICHTBARE LASER-STRAHLUNG TRITT AUS, WENN DECKEL (ODER KLAPPE) GEÖFFNET IST! NICHT DEM STRAHL AUSSETZEN!
VRW1094

HEMXJS type

or



HBXJS type

2. SPECIFICATIONS

Type ..... Compact disc digital audio system
Discs used ..... Compact disc
Power requirements
U.K. and Australian models ..... AC 240 V, 50/60 Hz
Multi-voltage models ..... AC 110/120—127/220/240 V (switchable), 50/60 Hz
Power consumption ..... 10 W
S/N ratio ..... 96 dB or more (EIAJ)
Frequency response..... 2 Hz to 20 kHz
Channels..... 2 (stereo)

Other

Dimensions..... 360 (W) x 90.5 (H) x 328.5 (D) mm
Weight ..... 3.8 kg

Accessories

Operating instructions 1

NOTE:
The specifications and design of this product are subject to change without notice, due to improvements.

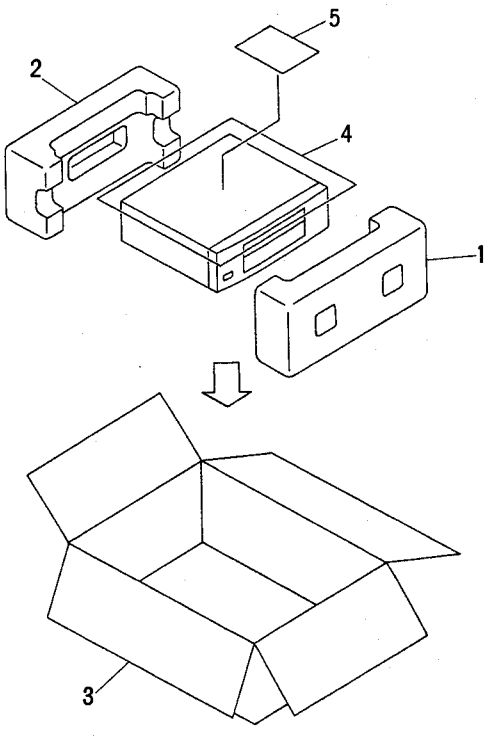
3. PACKING

NOTES:

- The parts with an encircled number are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by " ⊙ " are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

Mark	No.	Description	Part No.
	1	Protector (F)	PHA1180
	2	Protector (R)	PHA1181
	3	Packing case	PHG1803
	4	Mirror mat sheet	PHL1074
	5	Operating instructions (English/French/German/ Italian/Dutch/Swedish/ Spanish/Portuguese)	PRE1155



4. EXPLODED VIEWS AND PARTS LIST

4.1 EXTERIOR

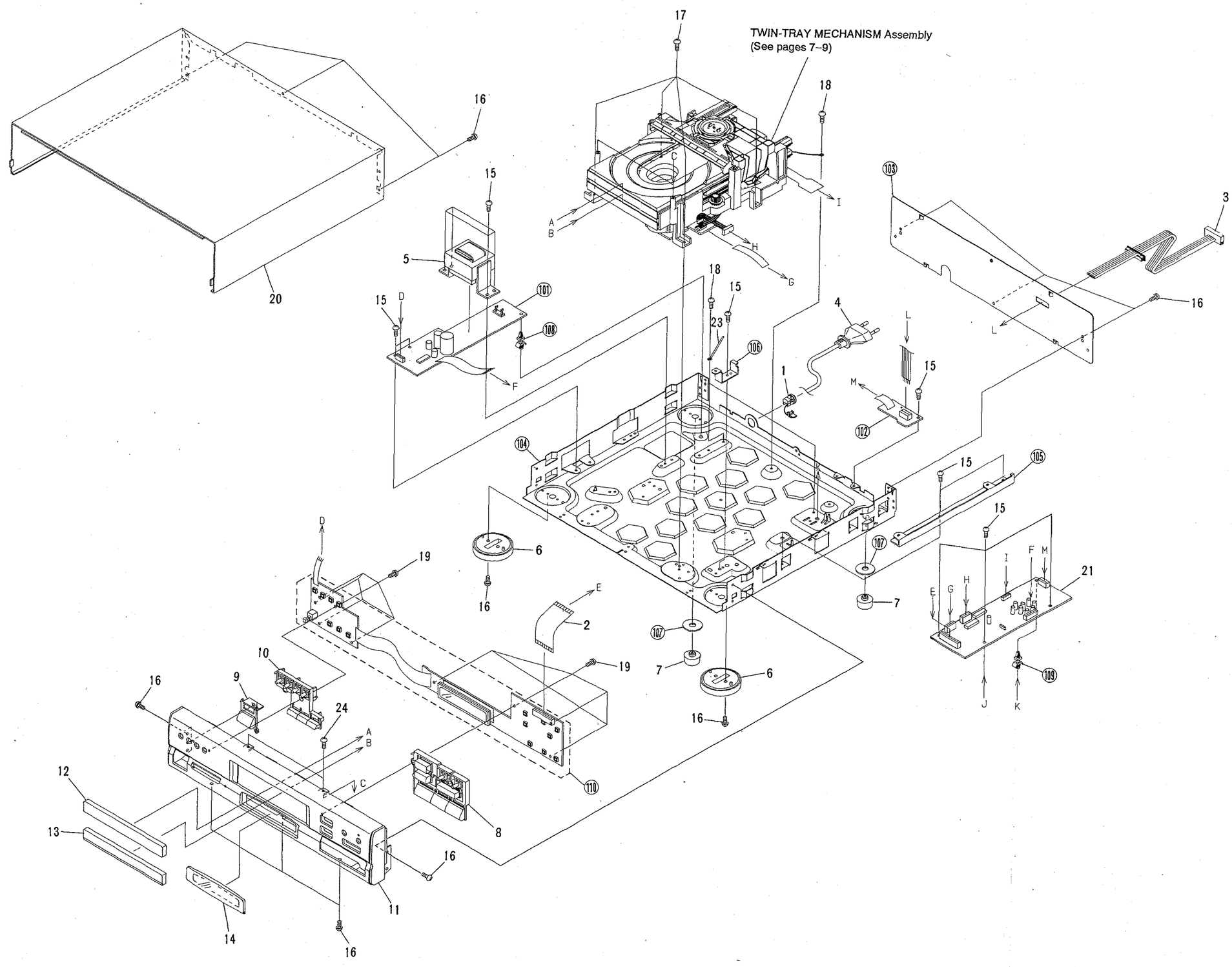
NOTES:

- The parts with an encircled number are generally unavailable because they are not in our Master Spare Parts List.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

Parts List

Mark	No.	Description	Part No.
⚠	1	Strain relief	CM – 22B
	2	24P F.F.C/30V	PDD1113
	3	Cord with connector	PDE1107
⚠	4	AC power cord	PDG1008
⚠	5	Power transformer	PTT1172
	6	Insulator assembly	RXA1448
	7	Insulator assembly	PXA1201
	8	Operate button	PAC1629
	9	Power button	PAC1630
	10	Mode button	PAC1631
	11	Operation panel	PNW2123
	12	Name plate 1	PNW2124
	13	Name plate 2	PNW2125
	14	FL lens	RAH2037
	15	Screw	BBZ30P060FCC
	16	Screw	BBZ30P080FCC
	17	Screw	BBZ30P080FMC
	18	Screw	PDZ30P050FMC
	19	Screw	PPZ30P120FMC
	20	Bonnet	PYY1160
⊙	21	Mother board assembly	PWM1641
	22	.....	
	23	Cord clamper	RNH – 184
	24	Screw	PPZ30P080FMC
	101	Power board assembly	PWZ2200
	102	Connector board assembly	PWZ2202
	103	Rear base	PNA1828
	104	Under base	PNA1832
	105	J angle	PNB1385
	106	JS angle	PNB1386
	107	Plate	PNM1158
	108	PCB holder	PNW2100
	109	PCB holder	PNW2174
	110	Function board assembly	PWZ2199

Exterior


TWIN-TRAY MECHANISM Assembly
(See pages 7–9)
17
18
16
15
5
101
108
15
D
F
18
15
23
106
4
L
1
M
15
102
103
3
16
L
104
105
15
15
107
7
6
16
6
19
16
D
E
2
10
9
16
24
A
B
C
12
13
14
16
11
16
8
19
110
107
7
6
16
21
F
M
I
H
E
G
J
K
109

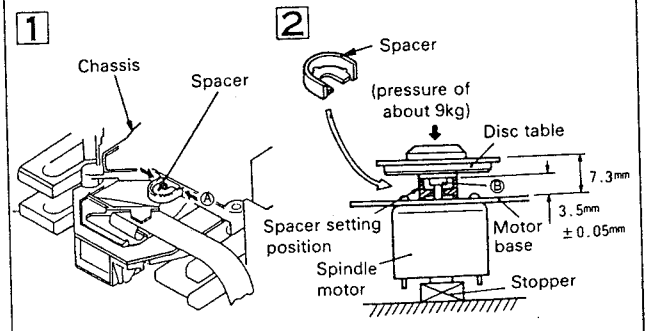
Parts List

Mark	No.	Description	Part No.
	1	Clamp spring	PBH1103
	2	Lever spring	PBH1104
	3	Belt	PEB1106
	4	Motor pulley	PNW1634
	5	Tray 1	PNW1986
	6	Tray 2	PNW1987
	7	Sub tray	PNW1985
	8	Loading base	PNW1842
	9	Main cam	PNW1843
	10	Follow gear	PNW1844
	11	Gear 1	PNW1845
	12	Gear 2	PNW1846
	13	Idler gear	PNW1847
	14	Clamper arm U	PNW1850
	15	Clamper arm B	PNW1851
	16	Clamp cam	PNW1852
	17	Float base	PNW2041
	18	Lock lever	PNW1854
	19	Motor (LOADING)	PXM1010
	20	Floating rubber	PEB1014
	21	Floating rubber	PEB1132
	22	Screw	PBA1048
	23	Screw	IPZ30P080FMC
	24	Screw	IPZ20P080FMC
	25	Screw	PMZ26P040FMC
	26	Gear pulley	PNW1848
	27	Push spring	PBH1105
	28	Screw	IPZ30P200FMC
	29	Screw	IBZ30P120FMC
	101	Yoke	PNB1216
	102	Clamper magnet	PMF1014
	103	Clamper holder	PNW1849
	104	Clamper S	PNW1609
	105	Mechanism PCB assembly	PWX1145
	106	Servo mechanism assembly T	PXA1349
	107	Sub plate	PNB1287

• How to install the disc table

1 Use nippers or other tool to cut the two sections marked Ⓐ in figure 1. Then remove the spacer.

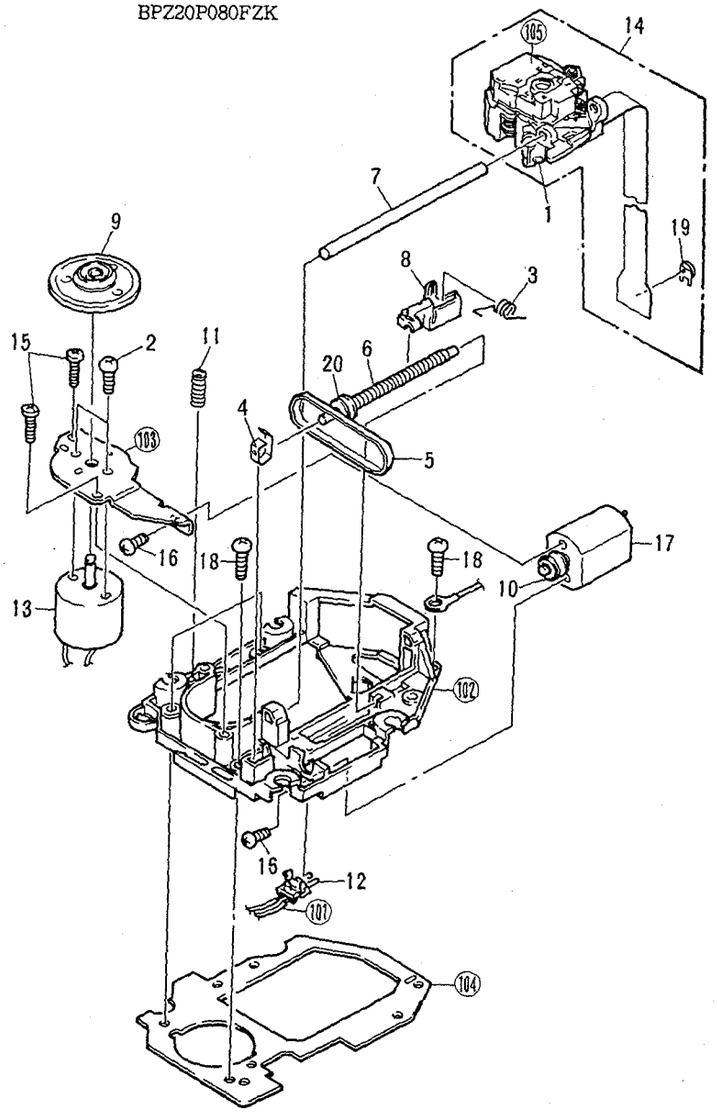
2 While supporting the spindle motor shaft with the stopper, put spacer on top of the motor base (angled so it doesn't touch section Ⓑ), and stick the disc table on top (takes about 9kg pressure). Take off the spacer.



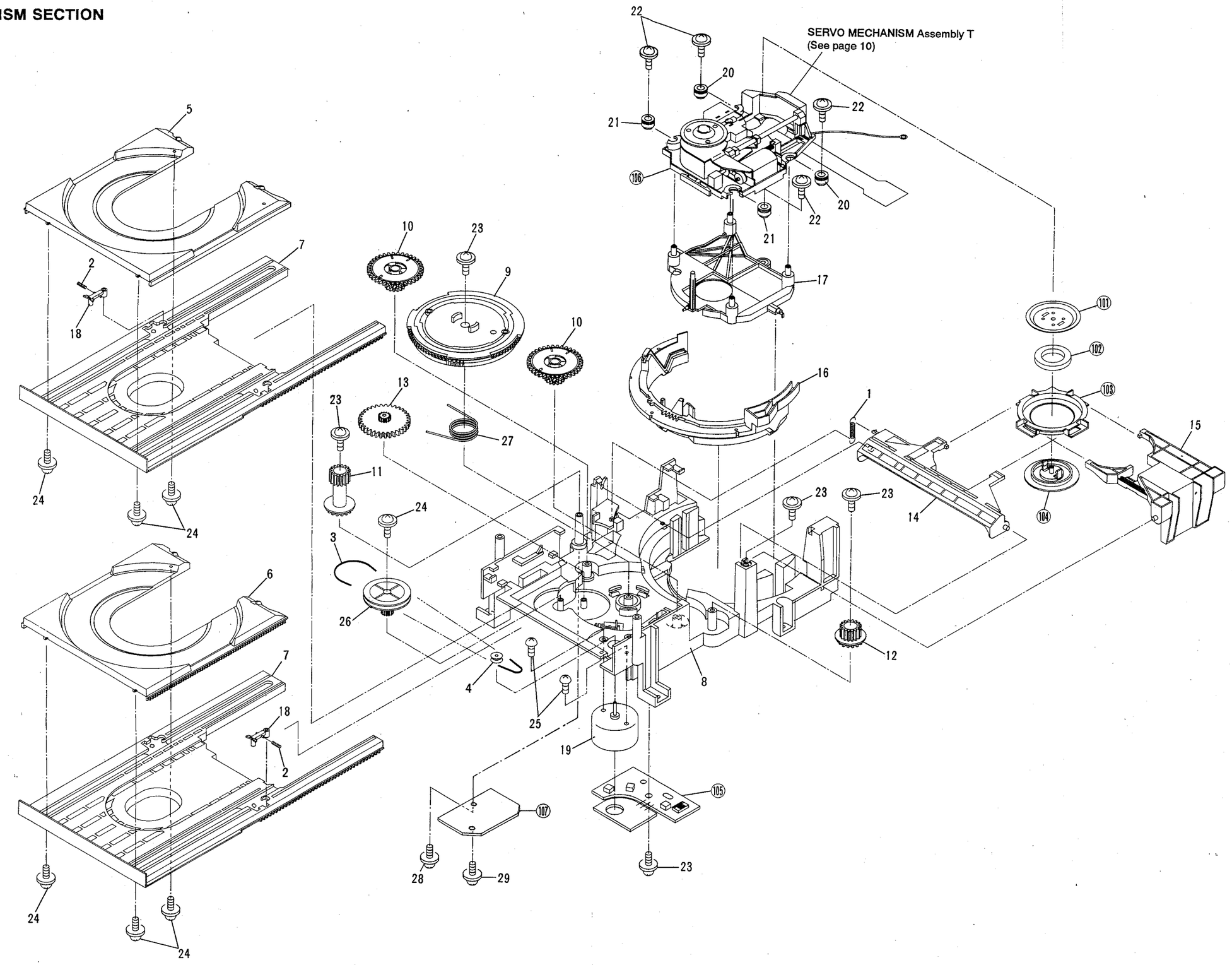
• Servo mechanism assembly T section

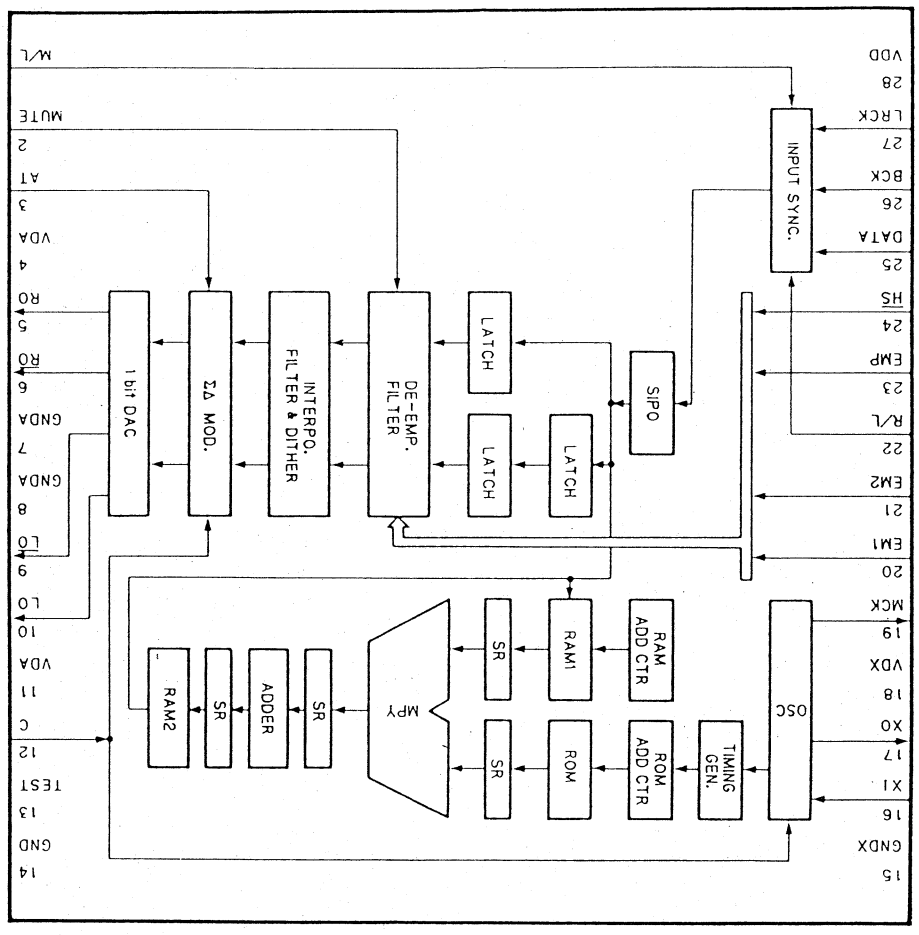
Parts List

Mark	No.	Description	Part No.
	1	Chip capacitor (C1001)	CKSYF105Z16
	2	Screw	JFZ20P025FMC
	3	Drive spring	PBH1084
	4	Plate spring	PBK1057
	5	Belt	PEB1072
	6	Drive screw	PLA1003
	7	Guide bar	PLA1071
	8	Half nut	PNW1605
	9	Disc table	PNW1608
	10	Pulley	PNW1634
	11	Earth spring	PBH1009
	12	Push switch	DSG1014
	13	Spindle motor assembly (with oil)	PEA1028
	14	Pick – up assembly	PEA1030
	15	Screw	BPZ20P080FZK
	16	Screw	PMZ20P030FMC
	17	Motor (CARRIAGE)	PXM1013
	18	Screw	PBZ30P080FMC
	19	Semi – fixed resistor (3.3k)	PCP1008
	20	Pulley	PNW1066
	101	Connector assembly (6P)	PDE1089
	102	Mechanism chassis	PNW1604
	103	Motor base	PNB1211
	104	Mechanism base	PNB1230
	105	Actuater cover	PNW1591

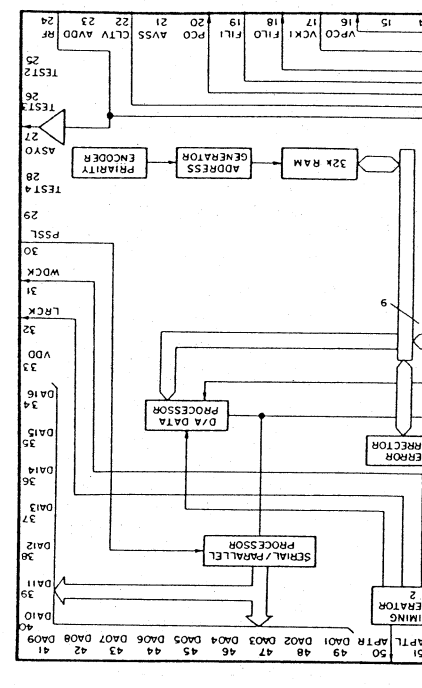


4.2 MECHANISM SECTION





TC9237BF



5. SCHEMATIC DIAGRAM

1. RESISTORS :
   Indicated in Ω, 1/4W, 1/6W, 1/8W, ± 5 % tolerance unless otherwise noted k;kΩ, M;MΩ, (F) ; ± 1 %, (G) ; ± 2 %, (K) ; ± 10 %, (M) ; ± 20 % tolerance.

2. CAPACITORS :
   Indicated in capacity (μ F) /voltage (V) unless otherwise noted p ; pF. Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE CURRENT :
   ; DC voltage (V) at play state.
   ← mA ; DC current at play state.
   ; Value in ( ) is DC current at stop state.

4. OTHERS :
   ➡ ; Signal route.
   ⊘ ; Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

   This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

● Terminal Voltages

IC151
(CXA1372Q)

Pin No.	Voltage	Pin No.	Voltage
1	0	25	5
2	0	26	0
3	0	27	5
4	0	28	0
5	0.2	29	0
6	0	30	N.C.
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5
10	5	34	-1.5
11	0	35	-1.7
12	0	36	5
13	0	37	-0.7
14	0.2 – 0.8	38	-1.6
15	0	39	0
16	-4	40	0.8
17	1.3	41	-5
18	0	42	0
19	-5	43	0
20	5	44	0
21	5	45	0
22	5	46	0
23	5	47	0
24	5	48	0

IC20
(M5298P)

Pin No.	Voltage	Pin No.	Voltage
1	-8.7	9	5
2	N. C.	10	N. C.
3	-5	11	0.6
4	0.2	12	5
5	-8.7	13	8.2
6	-6.9	14	5
7	N. C.	15	1.2
8	N. C.	16	8.2

IC301
(CXD2500AQ)

Pin No.	Voltage	Pin No.	Voltage
1	5	41	N. C.
2	N. C.	42	5
3	5	43	N. C.
4	2.6	44	N. C.
5	N. C.	45	N. C.
6	5	46	4.4
7	N. C.	47	0
8	N. C.	48	0
9	0	49	0 - 0.3
10	0	50	N. C.
11	N. C.	51	N. C.
12	0	52	0
13	N. C.	53	2.5
14	N. C.	54	N. C.
15	N. C.	55	0
16	N. C.	56	N. C.
17	0	57	N. C.
18	2.5	58	N. C.
19	2.4	59	0
20	2.4	60	N. C.
21	0	61	N. C.
22	2.5	62	N. C.
23	5	63	0
24	2.5	64	N. C.
25	N. C.	65	0
26	0	66	3.3 -4.6
27	2.5	67	5
28	0	68	0
29	N. C.	69	2.1 -3
30	0	70	5
31	N. C.	71	5
32	2.5	72	5
33	5	73	5
34	2.5	74	5
35	2.5	75	5
36	N. C.	76	0
37	N. C.	77	5
38	N. C.	78	5
39	N. C.	79	5
40	N. C.	80	0

IC401
(TC9237BF)

Pin No.	Voltage	Pin No.	Voltage
1	5	15	0
2	0	16	1.9
3	5	17	1.9
4	5.5	18	5
5	2.5	19	2
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5
11	5	25	2.5
12	0	26	2.5
13	N. C.	27	2.5
14	0	28	5

IC101
(CXA1471S)

Pin No.	Voltage	Pin No.	Voltage
1	N. C.	12	N. C.
2	2.9	13	-0.9
3	-4.7	14	-0.7
4	0	15	0
5	0	16	0
6	-5	17	0
7	0	18	0.8
8	0	19	0
9	N. C.	20	5
10	0	21	5
11	N. C.	22	N. C.

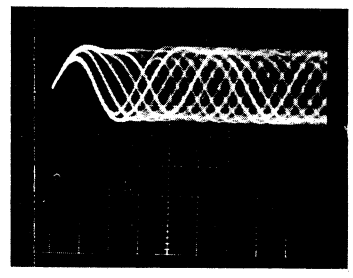
IC351 (PD4376A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5. 0	17	-16. 6	33	4. 9	49	0
2	-22. 7	18	-26. 0	34	3.9 ~ 4.2	50	NC
3	-22. 7	19	-5. 0	35	4. 9	51	5. 0
4	-22. 7	20	-1. 1	36	0	52	5. 0
5	-22. 7	21	-0.2~-1.9	37	4. 9	53	5. 0
6	-22. 7	22	1.1~ 1.6	38	1.2~ 2.5	54	5. 0
7	-22. 7	23	1.0~ 1.5	39	0	55	5. 0
8	-22. 7	24	0.6~ 1.5	40	5. 0	56	2. 3
9	-22. 7	25	0.1~ 1.2	41	NC	57	2. 3
10	NC	26	5. 0	42	0	58	0
11	NC	27	-1. 0	43	5. 0	59	0
12	0	28	-22. 0	44	0	60	5. 0
13	0	29	-12 ~ -18	45	5. 0	61	5. 0
14	NC	30	-0.3~-1.1	46	0	62	0
15	NC	31	4. 9	47	0	63	5. 0
16	-1. 0	32	4. 8	48	0	64	5. 0

Wave Forms

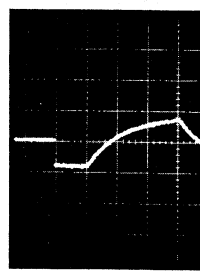
Note: The encircled numbers denote measuring points in the schematic diagram.

② TP1-Pin 1: PLAY MODE
(RF)
500mV/div 500nsec/div

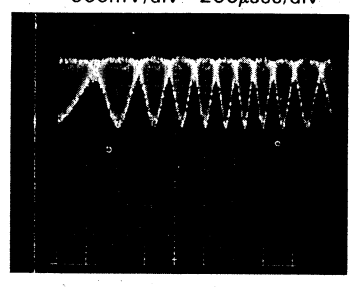


– GND

⑤ IC202-Pin 4: F
(FODR)
1V/div 200n

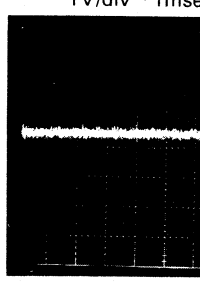


② TP1-Pin 1: TRACK SEARCH MODE
(RF)
500mV/div 200μsec/div

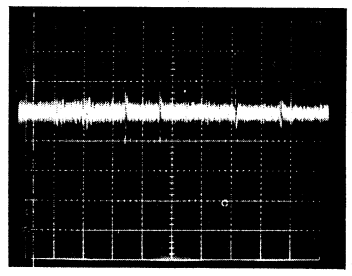


– GND

⑤ IC202-Pin 4: P
(FODR)
1V/div 1mse

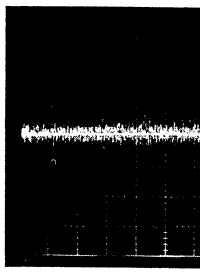


③ TP1-Pin 6: PLAY MODE
(FOER)
100mV/div 10msec/div

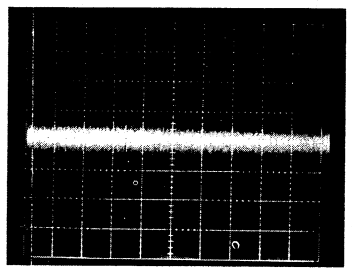


– GND

⑥ IC202-Pin 3: P
(TRDR)
500mV/div 1

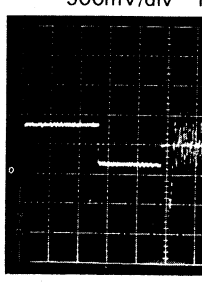


④ TP1-Pin 2: PLAY MODE
(TRER)
1V/div 10msec/div

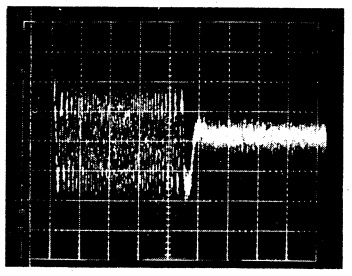


– GND

⑥ IC202-Pin 3: 50
(TRDR)
500mV/div 1

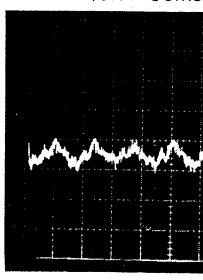


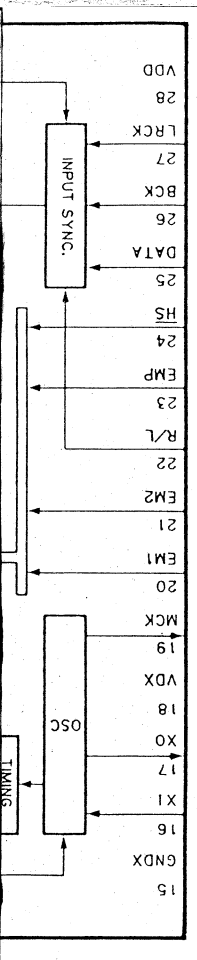
④ TP1-Pin 2: 50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div

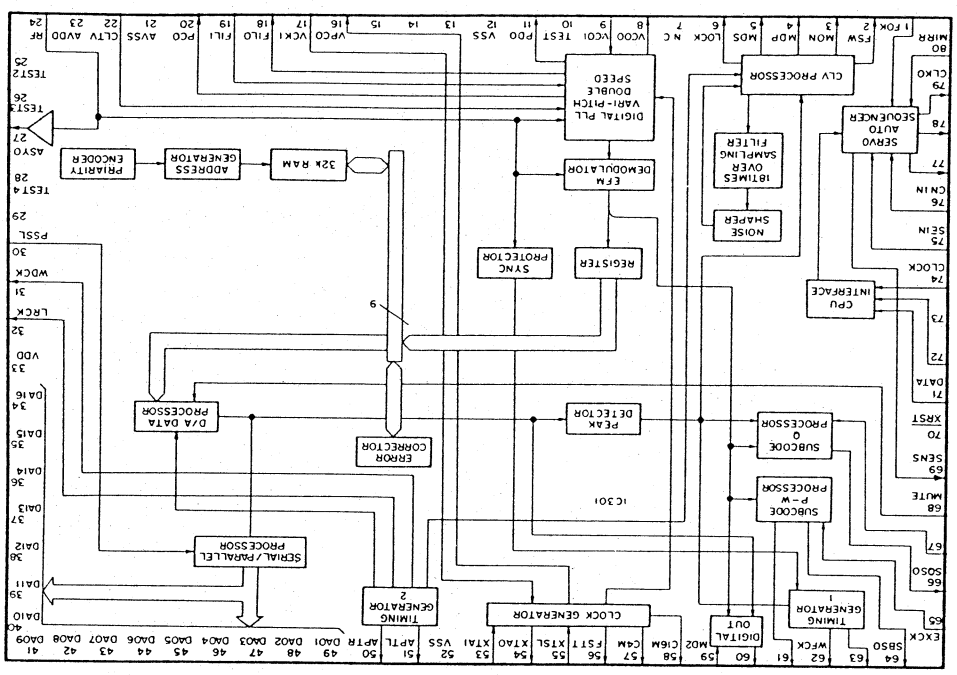


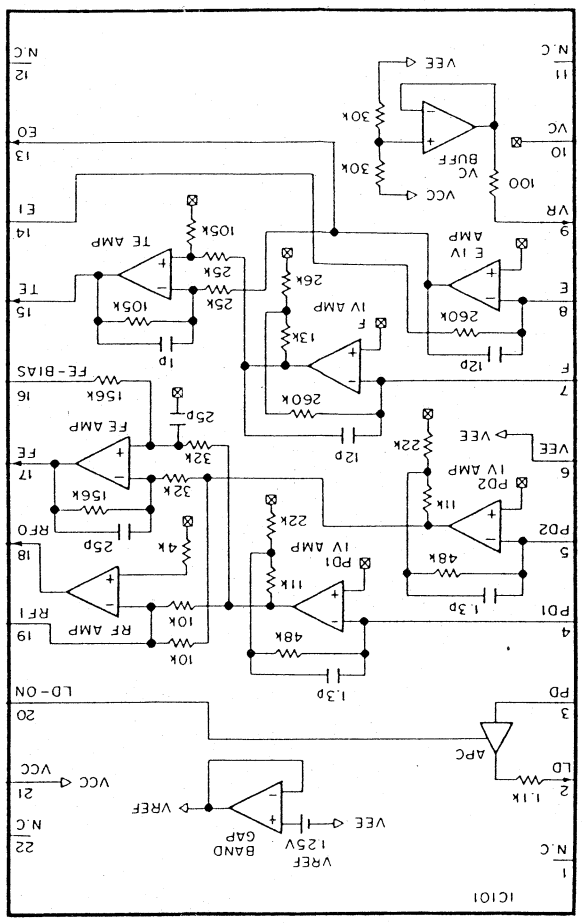
– GND

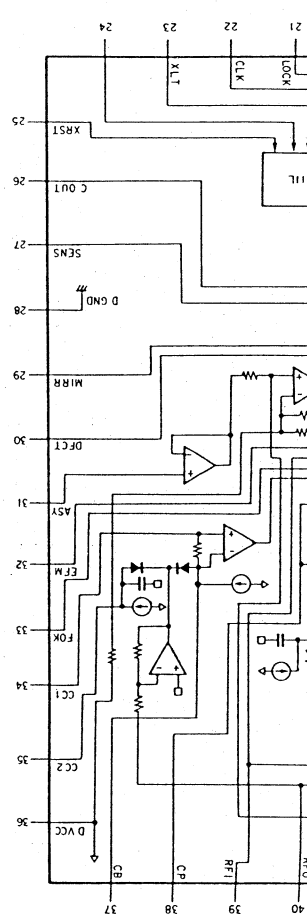
⑦ IC201-Pin 3: P
(SPDR)
1V/div 50ms









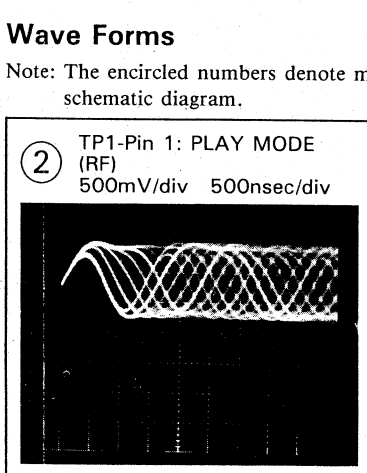


Wave Forms

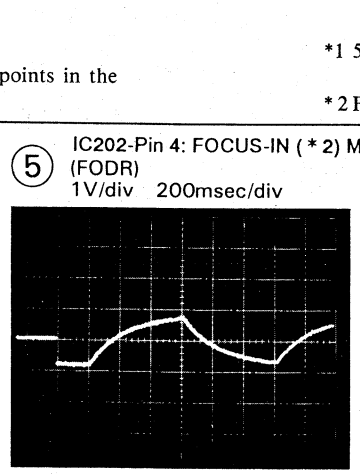
Note: The encircled numbers denote measuring points in the schematic diagram.

*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

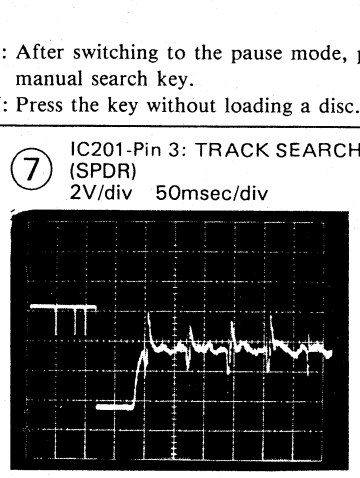
② TP1-Pin 1: PLAY MODE
(RF)
500mV/div 500nsec/div



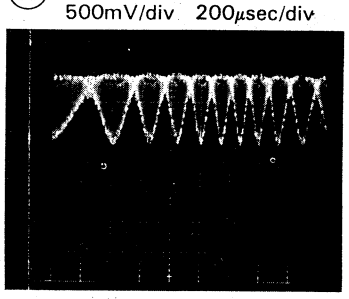
⑤ IC202-Pin 4: FOCUS-IN (*2) MODE
(FODR)
1V/div 200msec/div



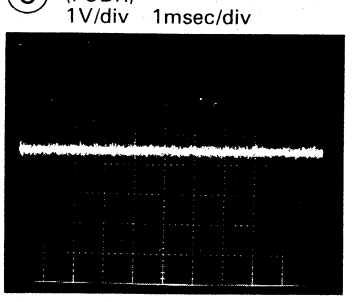
⑦ IC201-Pin 3: TRACK SEARCH MODE
(SPDR)
2V/div 50msec/div



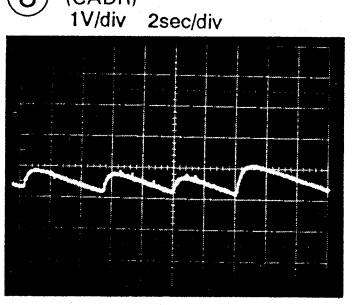
② TP1-Pin 1: TRACK SEARCH MODE
(RF)
500mV/div 200μsec/div



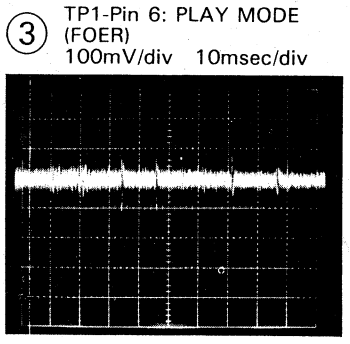
⑤ IC202-Pin 4: PLAY MODE
(FODR)
1V/div 1msec/div



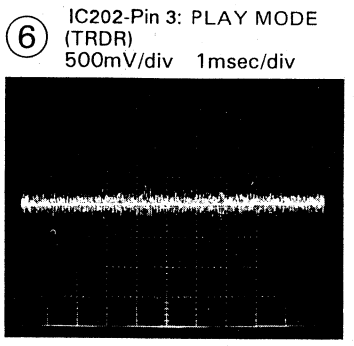
⑧ IC202-Pin 9: PLAY MODE
(CADR)
1V/div 2sec/div



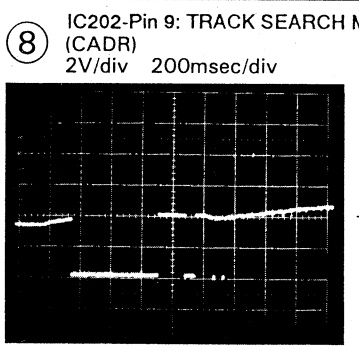
③ TP1-Pin 6: PLAY MODE
(FOER)
100mV/div 10msec/div



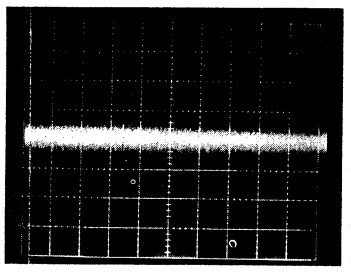
⑥ IC202-Pin 3: PLAY MODE
(TRDR)
500mV/div 1msec/div



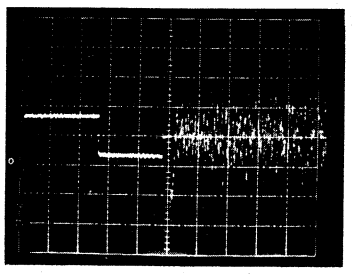
⑧ IC202-Pin 9: TRACK SEARCH MODE
(CADR)
2V/div 200msec/div



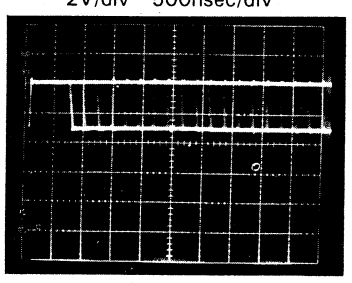
④ TP1-Pin 2: PLAY MODE
(TRER)
1V/div 10msec/div



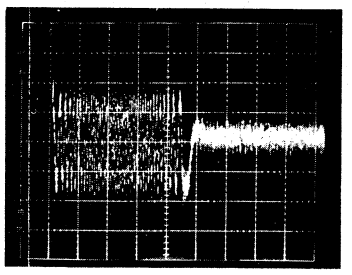
⑥ IC202-Pin 3: 50T-JUMP (*1) MODE
(TRDR)
500mV/div 1msec/div



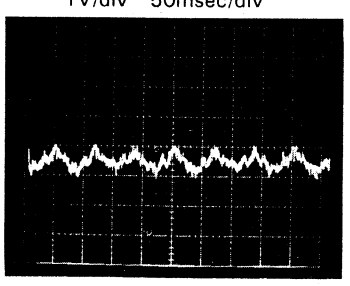
⑨ IC151-Pin 32: PLAY MODE
(EFM)
2V/div 500nsec/div



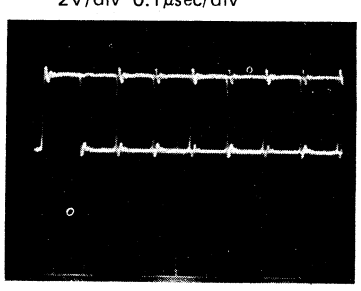
④ TP1-Pin 2: 50T-JUMP (*1) MODE
(TRER)
1V/div 1msec/div



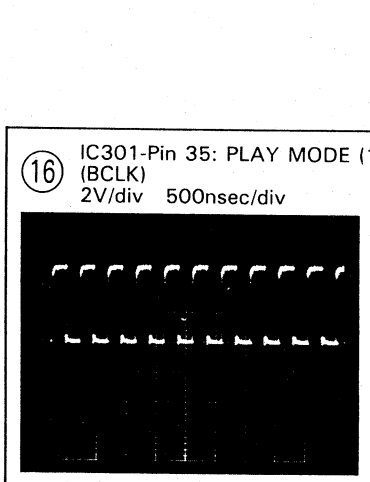
⑦ IC201-Pin 3: PLAY MODE
(SPDR)
1V/div 50msec/div



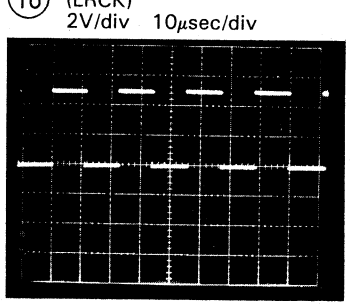
⑩ IC401-Pin 9: PLAY MODE
(D/A DATA OUT)
2V/div 0.1μsec/div



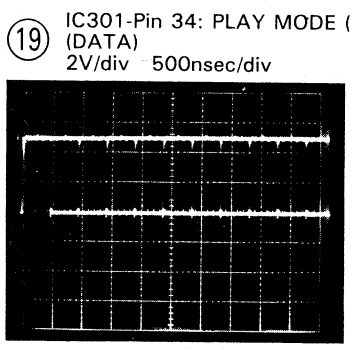
⑯ IC301-Pin 35: PLAY MODE (1kHz)
(BCLK)
2V/div 500nsec/div



⑱ IC301-Pin 32: PLAY MODE (1kHz)
(LRCK)
2V/div 10μsec/div

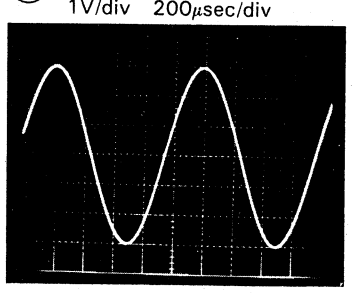


⑲ IC301-Pin 34: PLAY MODE (1kHz)
(DATA)
2V/div 500nsec/div

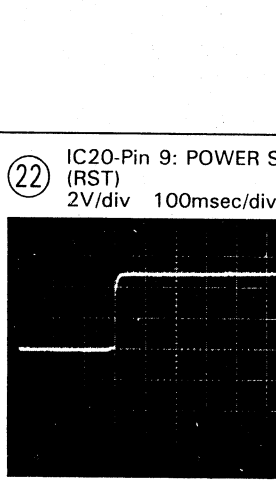


⑳

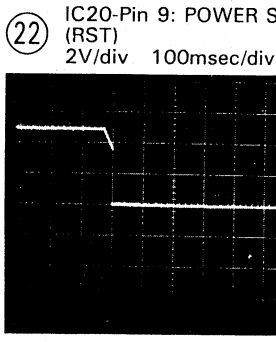
㉑ CN381-Pin 1: PLAY MODE (1kHz)
(L ch OUTPUT)
1V/div 200μsec/div



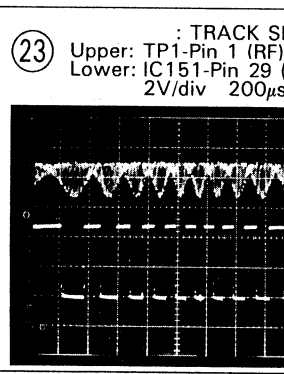
㉒ IC20-Pin 9: POWER S
(RST)
2V/div 100msec/div



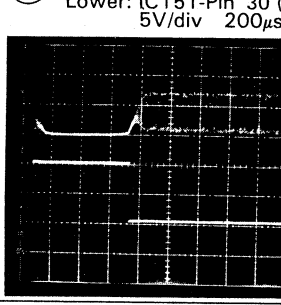
㉒ IC20-Pin 9: POWER S
(RST)
2V/div 100msec/div



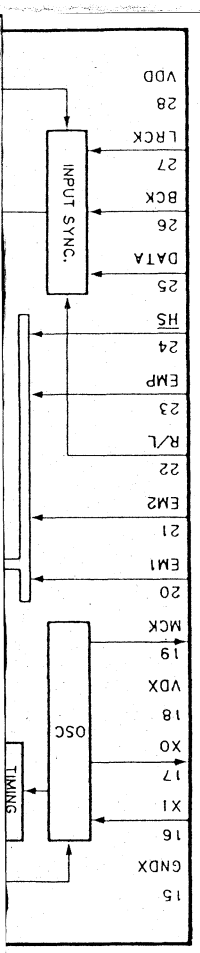
㉓ : TRACK SI
Upper: TP1-Pin 1 (RF)
Lower: IC151-Pin 29 (
2V/div 200μs

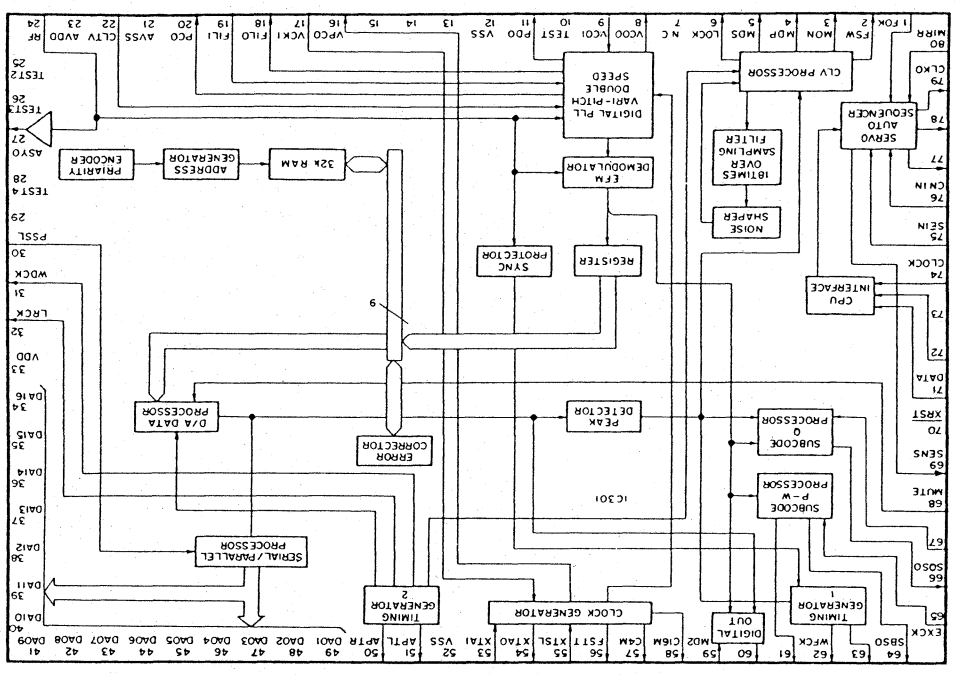


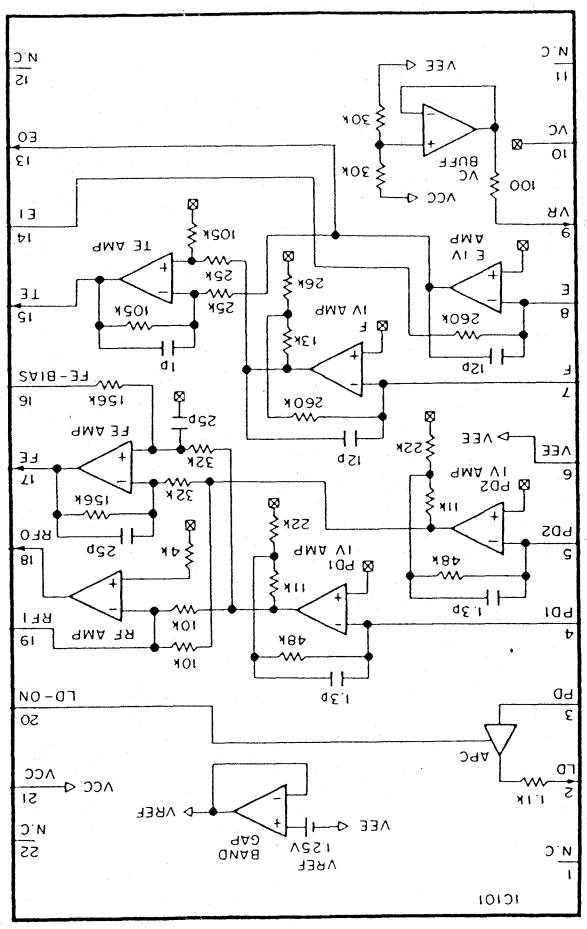
㉔ : PLAY MO
Upper: TP1-Pin 1 (RF)
Lower: IC151-Pin 30 (
5V/div 200μs

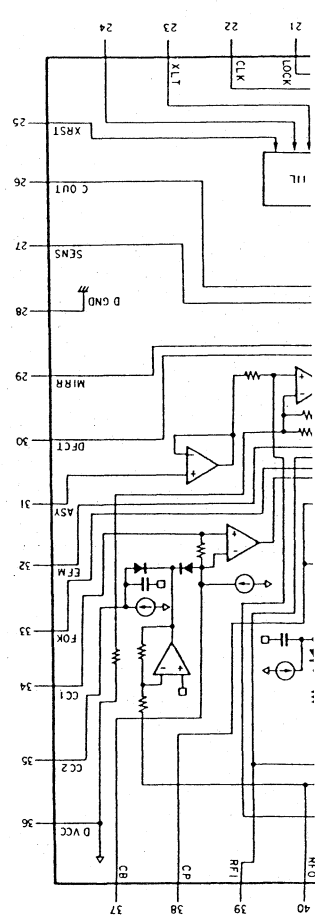


㉕







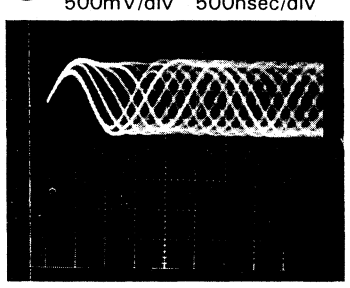


*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

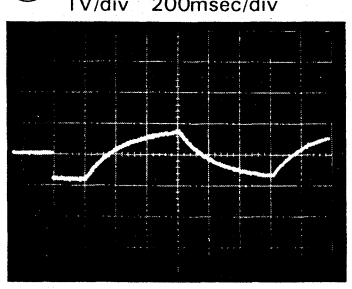
Wave Forms

Note: The encircled numbers denote measuring points in the schematic diagram.

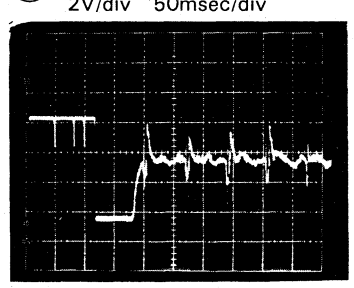
② TP1-Pin 1: PLAY MODE (RF) 500mV/div 500nsec/div — GND



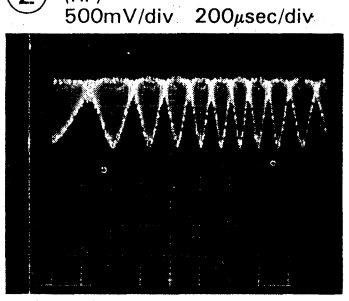
⑤ IC202-Pin 4: FOCUS-IN (*2) MODE (FODR) 1V/div 200msec/div — GND



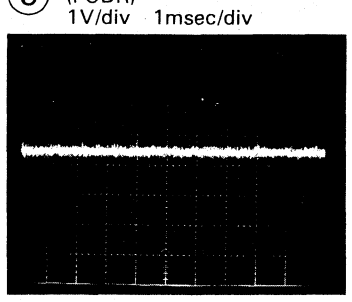
⑦ IC201-Pin 3: TRACK SEARCH MODE (SPDR) 2V/div 50msec/div — GND



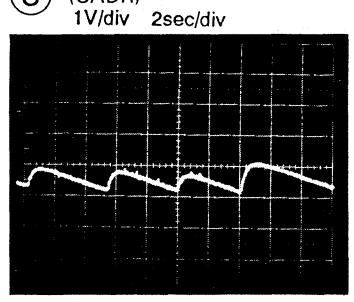
② TP1-Pin 1: TRACK SEARCH MODE (RF) 500mV/div 200μsec/div — GND



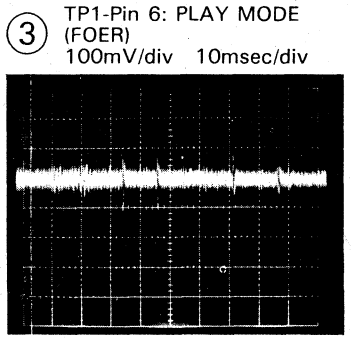
⑤ IC202-Pin 4: PLAY MODE (FODR) 1V/div 1msec/div — GND



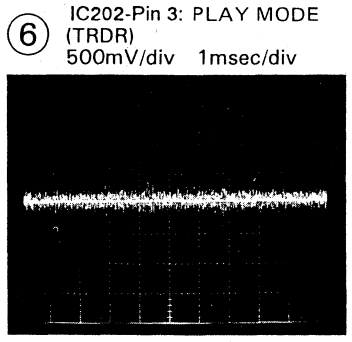
⑧ IC202-Pin 9: PLAY MODE (CADR) 1V/div 2sec/div — GND



③ TP1-Pin 6: PLAY MODE (FOER) 100mV/div 10msec/div — GND

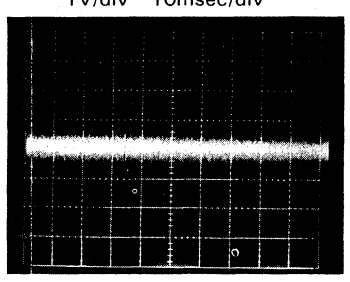


⑥ IC202-Pin 3: PLAY MODE (TRDR) 500mV/div 1msec/div — GND

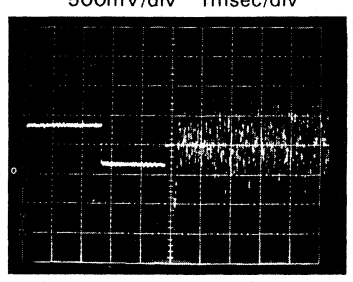


⑧ IC202-Pin 9: TRACK SEARCH MODE (CADR) 2V/div 200msec/div — GND

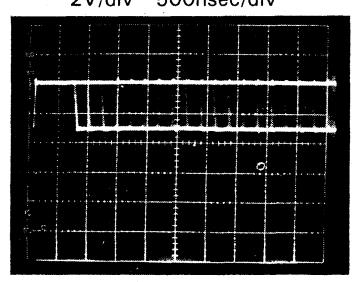
④ TP1-Pin 2: PLAY MODE (TRER) 1V/div 10msec/div — GND



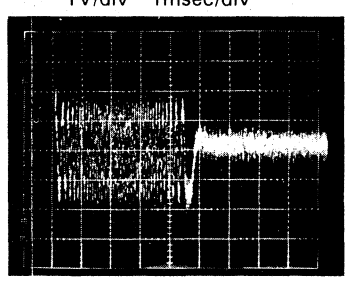
⑥ IC202-Pin 3: 50T-JUMP (*1) MODE (TRDR) 500mV/div 1msec/div — GND



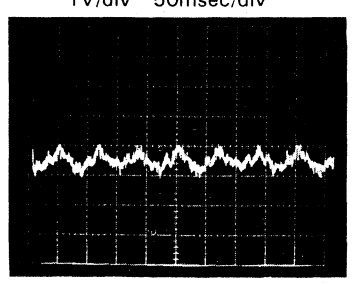
⑨ IC151-Pin 32: PLAY MODE (EFM) 2V/div 500nsec/div — GND



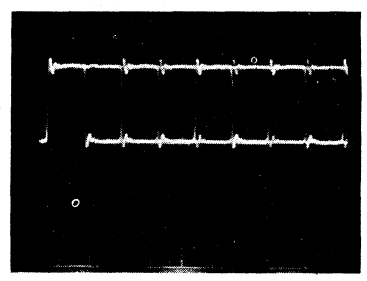
④ TP1-Pin 2: 50T-JUMP (*1) MODE (TRER) 1V/div 1msec/div — GND



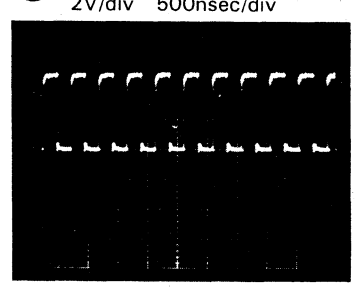
⑦ IC201-Pin 3: PLAY MODE (SPDR) 1V/div 50msec/div — GND



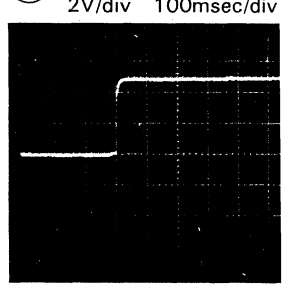
⑩ IC401-Pin 9: PLAY MODE (D/A DATA OUT) 2V/div 0.1μsec/div



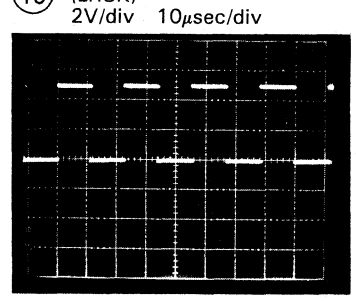
⑯ IC301-Pin 35: PLAY MODE (1kHz) (BCLK) 2V/div 500nsec/div — GND



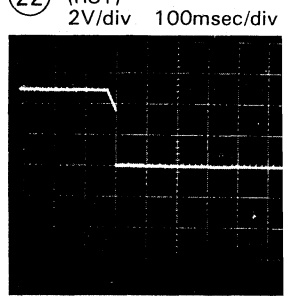
㉒ IC20-Pin 9: POWER S (RST) 2V/div 100msec/div



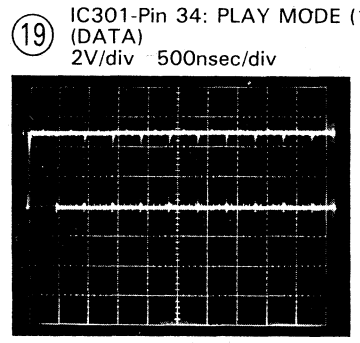
⑱ IC301-Pin 32: PLAY MODE (1kHz) (LRCK) 2V/div 10μsec/div — GND



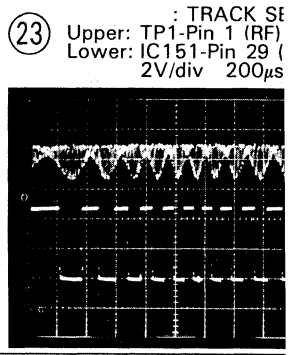
㉒ IC20-Pin 9: POWER S (RST) 2V/div 100msec/div



⑲ IC301-Pin 34: PLAY MODE (1kHz) (DATA) 2V/div 500nsec/div — GND

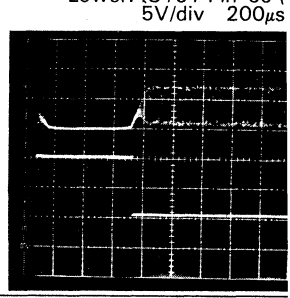


㉓ : TRACK SE
Upper: TP1-Pin 1 (RF)
Lower: IC151-Pin 29 (
2V/div 200μs

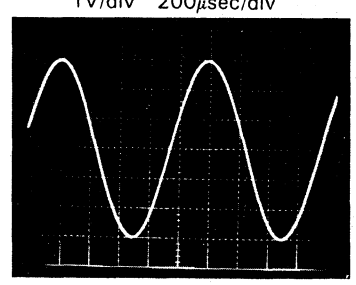


⑳

㉔ : PLAY MOI
Upper: TP1-Pin 1 (RF)
Lower: IC151-Pin 30 (
5V/div 200μs



㉑ CN381-Pin 1: PLAY MODE (1kHz) (L ch OUTPUT) 1V/div 200μsec/div — GND



㉕

*1 50T-JUMP: After switching to the pause mode, press the manual search key.
*2 FOCUS-IN: Press the key without loading a disc.

FOCUS-IN (*2) MODE
0msec/div
– GND

PLAY MODE
sec/div
– GND

PLAY MODE
1msec/div
– GND

50T-JUMP (*1) MODE
1msec/div
– GND

PLAY MODE
nsec/div
– GND

⑦ IC201-Pin 3: TRACK SEARCH MODE (SPDR)
2V/div 50msec/div
– GND

⑧ IC202-Pin 9: PLAY MODE (CADR)
1V/div 2sec/div
– GND

⑧ IC202-Pin 9: TRACK SEARCH MODE (CADR)
2V/div 200msec/div
– GND

⑨ IC151-Pin 32: PLAY MODE (EFM)
2V/div 500nsec/div
– GND

⑩ IC401-Pin 9: PLAY MODE (D/A DATA OUT)
2V/div 0.1μsec/div

⑯ IC301-Pin 35: PLAY MODE (1kHz) (BCLK)
2V/div 500nsec/div
– GND

⑱ IC301-Pin 32: PLAY MODE (1kHz) (LRCK)
2V/div 10μsec/div
– GND

⑲ IC301-Pin 34: PLAY MODE (1kHz) (DATA)
2V/div 500nsec/div
– GND

⑳

㉑ CN381-Pin 1: PLAY MODE (1kHz) (L ch OUTPUT)
1V/div 200μsec/div
– GND

㉒ IC20-Pin 9: POWER SWITCH-ON (RST)
2V/div 100msec/div
– GND

㉒ IC20-Pin 9: POWER SWITCH-OFF (RST)
2V/div 100msec/div
– GND

㉓ : TRACK SEARCH MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 29 (MIRR)
2V/div 200μsec/div
– GND
– GND

㉔ : PLAY MODE
Upper: TP1-Pin 1 (RF) 1V/div
Lower: IC151-Pin 30 (DFCT)
5V/div 200μsec/div
– GND
– GND

㉕

㉖

㉗

㉘

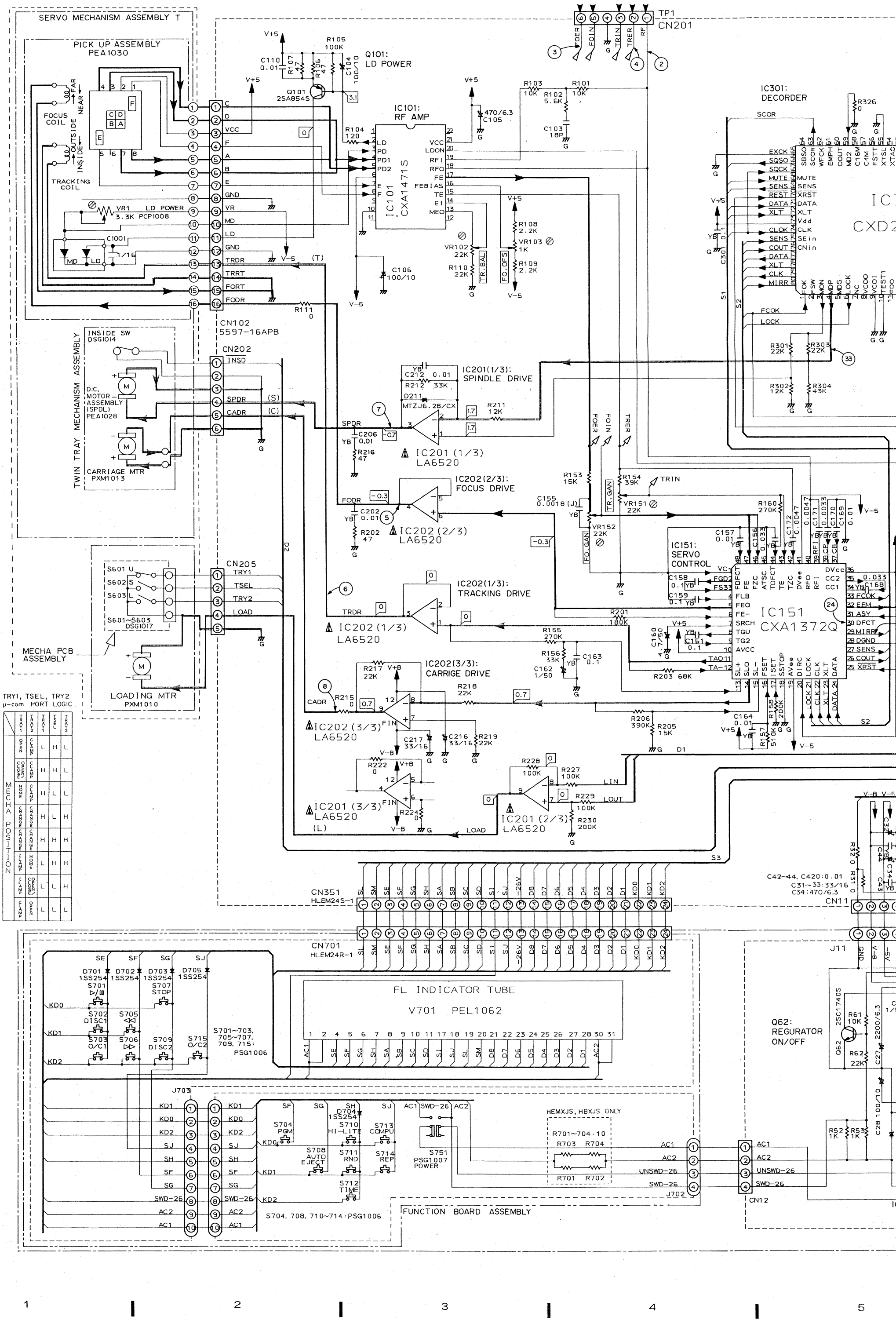
㉝ IC301-Pin 4: PLAY MODE (MDP)
2V/div 2μsec/div
– GND

㊸ IC301-Pin 20: PLAY MODE (PCO)
2V/div 10μsec/div
– GND

CXD2500AQ

CXA1471S

CXA1372Q


SERVO MECHANISM ASSEMBLY T
PICK UP ASSEMBLY
PEA1030
FOCUS COIL
TRACKING COIL
FAR
NEAR
OUTSIDE
INSIDE
VR1 LD POWER
3.3K PCP1008
C1001
1/16
MD
LD
CN102
5597-16APB
C
D
VCC
F
A
B
E
GND
VR
MD
LD
GND
TRDR
TRRT
FORT
FODR
V+5
V-5
(T)
R111
0
Q101:
LD POWER
Q101
2SA854S
C110
0.01
R107
47
R106
47
R105
100K
C104
100/10
R104
120
IC101:
RF AMP
IC101
CXA1471S
LD
PD
PD1
PD2
VCC
LDON
RFI
RFO
FE
FEBIAS
TE
EI
MEO
C106
100/10
R103
10K
R101
10K
R102
5.6K
C103
18P
470/6.3
C105
VR102
22K
R110
22K
TR.BAL
FO.OFS
R108
2.2K
VR103
1K
R109
2.2K
TP1
CN201
FOER
FOIN
TRIN
TRER
RF
IC301:
DECORDER
R326
0
SCOR
EXCK
SQSO
SQCK
MUTE
SENS
REST
DATA
XLT
Vdd
CLCK
SEin
COUT
CNin
DATA
XLT
CLK
MIRR
FCOK
LOCK
R301
22K
R303
22K
R302
12K
R304
43K
TWIN TRAY MECHANISM ASSEMBLY
INSIDE SW
DSG1014
D.C.
MOTOR
ASSEMBLY
(SPDL)
PEA1028
CARRIAGE MTR
PXM1013
CN202
INSD
SPDR
CADR
(S)
(C)
IC201(1/3):
SPINDLE DRIVE
YB
C212 0.01
R212 33K
D211
MTZJ6.2B/CX
R211
12K
SPDR
C206
0.01
R216
47
IC201 (1/3)
LA6520
IC202(2/3):
FOCUS DRIVE
FODR
C202
0.01
R202
47
IC202 (2/3)
LA6520
R153
15K
R154
39K
TRIN
VR151
22K
TR.GAN
C155
0.0018 (J)
VR152
22K
FO.GAN
R160
270K
C157
0.01
C156
0.033
C172
0.0047
C171
0.0033
C170
0.0047
C169
0.01
IC151:
SERVO
CONTROL
IC151
CXA1372Q
VC1
FDFCT
FE
FZC
ATSC
TDFCT
TE
TZC
DVee
RFO
RFI
DVcc
CC2
CC1
FCOK
EEM
ASY
DFCT
MIRR
DGND
SENS
COUT
XRST
FGD2
FS33
FLB
FEO
FE-
SRCH
TGU
TG2
AVCC
TAO
TA-
SL+
SLO
SL-
FSET
ISET
SSTOP
AVee
DIRC
LOCK
CLK
XLT
DATA
C158
0.1
C159
0.1
C160
4.7/50
C161
0.1
R203 68K
R201
180K
R155
270K
R156
33K
C162
1/50
C163
0.1
IC202(1/3):
TRACKING DRIVE
TRDR
IC202 (1/3)
LA6520
IC202(3/3):
CARRIGE DRIVE
CADR
R215
0
R217
22K
V+B
R218
22K
IC202 (3/3)
LA6520
FIN
C217
33/16
C216
33/16
R219
22K
R222
0
R224
0
IC201 (3/3)
LA6520
(L)
R228
100K
R227
100K
R229
100K
R230
200K
LIN
LOUT
LOAD
R206
390K
R205
15K
C164
0.01
R157
510K
R158
200K
S1
S2
S3
D1
D2
CN205
TRY1
TSEL
TRY2
LOAD
S601 U
S602 S
S603 L
S601~S603
DSG1017
MECHA PCB
ASSEMBLY
LOADING MTR
PXM1010
TRY1, TSEL, TRY2
μ-com PORT LOGIC
MECHA POSITION
OPEN
CLAMP
CHANGE
HOME
CR43P
CR33P
CR43P
CR33P
CN351
HLEM24S-1
CN701
HLEM24R-1
SL SM SE SF SG SH SA SB SC SD S1 SJ -26V D8 D7 D6 D5 D4 D3 D2 D1 KD0 KD1 KD2
SE
SF
SG
SJ
D701 1SS254
D702 1SS254
D703 1SS254
D705 1SS254
S701
S707 STOP
S702 DISC1
S705
S703 O/C1
S706
S709 DISC2
S715 O/C2
S701~703,
705~707,
709, 715:
PSG1006
FL INDICATOR TUBE
V701 PEL1062
1 2 4 5 6 7 8 9 10 11 17 18 19 20 21 22 23 24 25 26 27 28 30 31
AC1 SE SF SG SH SA SB SC SD S1 SJ SL SM D8 D7 D6 D5 D4 D3 D2 D1 AC2
J703
S704
PGM
S708
AUTO
EJECT
D704
1SS254
S710
HI-LITE
S711
RND
S712
TIME
S713
COMPU
S714
REP
S704, 708, 710~714: PSG1006
AC1 SWD-26 AC2
S751
PSG1007
POWER
HEMXJS, HBXJS ONLY
R701~704: 10
R703 R704
R701 R702
UNSWD-26
SWD-26
J702
CN12
FUNCTION BOARD ASSEMBLY
J11
GND
V-B
-5V
C42~44, C420: 0.01
C31~33: 33/16
C34: 470/6.3
CN11
Q62:
REGURATOR
ON/OFF
2SC1740S
R61
10K
R62
22K
C27
2200/6.3
C28
100/10
R52
1K
R53
1K

MOTHER BOARD ASSEMBLY
PWM1641

TP1
CN201

IC301:
DECORDER

IC301
CXD2500AQ

IC401:
D/A CONVERTER &
DIGITAL FILTER

IC401
TC9237BF

IC405 (1/2)
NJM4558D-D

IC405:
LOW PASS FILTER

IC405 (2/2)
NJM4558D-D

Q406:
INVERTER
BUFFER

Q406
DTA124ES

Q405
DTC124ES

Q405:
MUTE DRIVE

Q381, Q382:
BUFFER

Q381
2SC1740S
(R/S)

Q382
2SC1740S
(R/S)

IC151:
SERVO
CONTROL

IC151
CXA1372Q

IC351:
SYSTEM
CONTROL

IC351
PD4376A

X401
PSS1006

X351
VSS1014

S351
PSG1006

VR151 22K
TR. GAN

VR152 22K
FO. GAN

TRIN

SUB BOARD ASSEMBLY (1/2)
PWX1195 HEMXJS, HBXJS
PWX1197 : SD
PWX1196 : HPW

POWER BOARD ASSEMBLY

Q62:
REGURATOR
ON/OFF

IC20
M5298P

IC20: SYSTEM RESET & ±5V
REGULATOR

POWER
TRANSFORMER
PTT1126

PTT 1172 : HEXJS, HBXJS
PTT 1125 : HPW

AC POWER CORD
HEMXJS: PDG1008
HBXJS: PDG1021
HPW: PDG1011
220-230/240V
50/60Hz

SD ONLY

D381–D383: 1SS133X

C42~44, C420 : 0.01
C31~33 : 33/16
C34 : 470/6.3

R101 10K
R153 15K
R154 39K
R160 270K
R201 180K
R203 68K
R206 390K
R205 15K
R227 100K
R229 100K
R230 200K
R301 22K
R302 12K
R303 22K
R304 43K
R305 3.3K
R306 6.8K
R307 10K
R308 10K
R309 100K
R310 470
R311 470
R312 470
R326 0
R352 10K
R355 10K
R356 10K
R362 0
R363 0
R371 100K
R372 100K
R405 1K
R430 18K
R428 18K
R429 18K
R436 36K
R438 36K
R435 36K
R437 36K
R439 47K
R440 47K
R441 47K
R442 47K
R496 2.2K
R387 22K
R388 22K
R384 22K
R389 22K
R385 22K
R386 22K
R381 56K
R382 100K
R383 100K
R450 0
R392
R393
R391

C301 0.1
C302 33/15
C304 0.1
C306 0.0015
C307 0.047
C308 0.01
C309 0.47/50
C310 0.01
C361 0.01
C375 0.01
C410 0.1
C411 0.1
C414 0.1
C421 0.047
C424 0.047
C403 47P
C404 47P
C416 0.1
C422 0.1
C418 0.1
C419 0.1
C423 0.1
C415 0.1
C356 0.01
C426 0.047
C41 0.01
C42 0.01
C43 0.01
C44 0.01
C33 0.01
C34 0.01
C157 0.01
C156 0.033
C172 0.0047
C171 0.0047
C170 0.0033
C169 0.01
C158 0.1
C159 0.1
C160 4.7/50
C161 0.1
C163 0.1
C164 0.01
C167 0.01
C168 0.033
C354 0.01
C353 0.01
C351 33/16
C352 0.01
C431 0.1
C437 39P
C434 22/25
C435 39P
C436 39P
C438 39P
C433 22/25
C432 0.1
C430 56P
C429 56P
C427 2200/6.3
C28 100/10
C25 4700/16
C26 2200/16
C16 0.01
C14 0.01
C15 0.01
C12 0.01
C13 0.01
C11 0.01
C52 100/35
C60 1/50

D11 11ES2
D12 11ES2
D13 11ES2
D14 11ES2
D52 11ES2
D54 MTZJ18B/C
D381
D382
D383

R61 10K
R62 22K
R51 10K
R52 1K
R53 1K
Q62 2SC1740S

LFA010K
L402 1.0

MNT0 MNT1 MNT2 MNT3
UGFS GTOP LRCK (64)
BCLK (64) DATA (64) BCLK (48) DATA (48)
LRCK (48) WDCK (48)
EXCK SQSO SQCK MUTE SENS REST DATA XLT CLOK SENS COUT DATA XLT CLK MIRR
FCOK LOCK
TRY1 TSEL TRY2
REQ ENB DAOT DAIN SCK
DEMP XLT MUTE SENS GFS SCOR SQSO DATA CLOK
JNSD
S1 S2 S3 D1 D2
PA

J11 GND V-B V-5 GND +5V V+B A.G RSET
CN11
CN12 AC1 AC2 UNSWD-26 SWD-26
J702
R701~704 : 10
R703 R704 R701 R702
HEMXJS, HBXJS ONLY

C42~44, C420 : 0.01
C31~33 : 33/16
C34 : 470/6.3

:Focus s
:Signal
(L) :Loading
(T) :Trackin
(S) :Spindle
(C) :Carriag
:Measure

MOTHER BOARD ASSEMBLY
PWM1641

IC401:
D/A CONVERTER &
DIGITAL FILTER

IC401
TC9237BF

IC405:
LOW PASS FILTER

IC405 (1/2)
NJM4558D-D

IC405 (2/2)
NJM4558D-D

Q403, 404:
MUTE

Q406:
INVERTER
BUFFER

Q405:
MUTE DRIVE

IC351
PD4376A

IC351:
SYSTEM
CONTROL

Q381, Q382:
BUFFER

D381–D383:1SS133X

SUB BOARD ASSEMBLY (2/2)
PWX1195: HEMXJS, HBXJS
PWX1197 : SD
PWX1196 : HPW

CONNECTOR BOARD
ASSEMBLY

CN383

CN382
KPE9

CHASSIS GROUND

SUB BOARD ASSEMBLY (1/2)
PWX1195 HEMXJS, HBXJS
PWX1197 : SD
PWX1196 : HPW

POWER BOARD ASSEMBLY

IC20
M5298P

IC20: SYSTEM RESET & ±5V
REGULATOR

PTT 1172 : HEXJS, HBXJS
PTT 1125 : HPW

SD ONLY

AC POWER CORD
RDG1003
AC110/120-127
/220/240V
50/60Hz

PSB1002

POWER
TRANSFORMER
PTT1126

240V
220V
120-127V
110V

AC POWER CORD
HEMXJS: PDG1008
HBXJS: PDG1021
HPW: PDG1011
220-230/240V
50/60Hz

:Focus servo loop
:Signal route
(L) :Loading motor drive signal
(T) :Tracking servo signal
(S) :Spindle motor drive signal
(C) :Carriage motor drive signal
:Measurement point

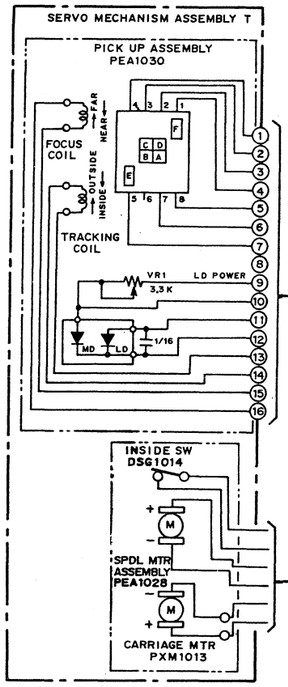
6. PCB CONNECTION DIAGRAMS

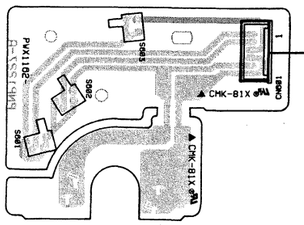
IC301 (CXD2500AQ)

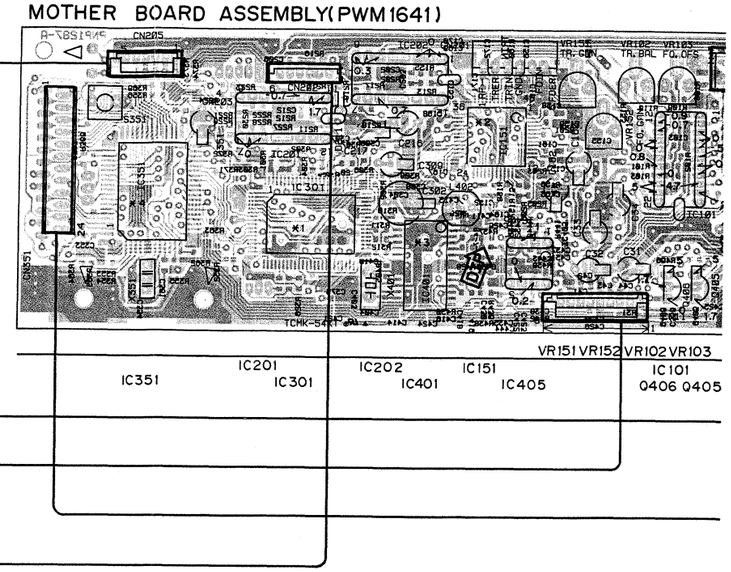
Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5.0	21	0	41	NC	61	NC
2	NC	22	2.5	42	5.0	62	NC
3	5.0	23	5.0	43	NC	63	0
4	2.6	24	2.5	44	NC	64	NC
5	NC	25	NC	45	NC	65	0
6	5.0	26	0	46	4.4	66	2.1 ~ 4.6
7	NC	27	2.5	47	0	67	5.0
8	NC	28	0	48	0	68	0
9	0	29	NC	49	0 ~ 4.1	69	2.1 ~ 2.8
10	0	30	0	50	NC	70	5.0
11	NC	31	NC	51	NC	71	5.0
12	0	32	2.5	52	0	72	5.0
13	NC	33	5.0	53	2.5	73	5.0
14	NC	34	2.5	54	NC	74	5.0
15	NC	35	2.5	55	0	75	5.0
16	NC	36	NC	56	NC	76	0
17	0	37	NC	57	NC	77	5.0
18	2.5	38	NC	58	NC	78	5.0
19	2.4	39	NC	59	0	79	5.0
20	2.4	40	NC	60	NC	80	0

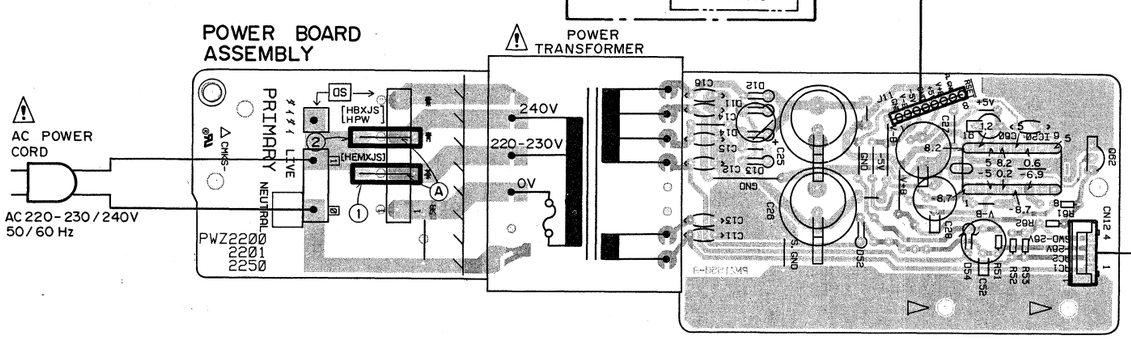
IC151 (CXA1372Q)

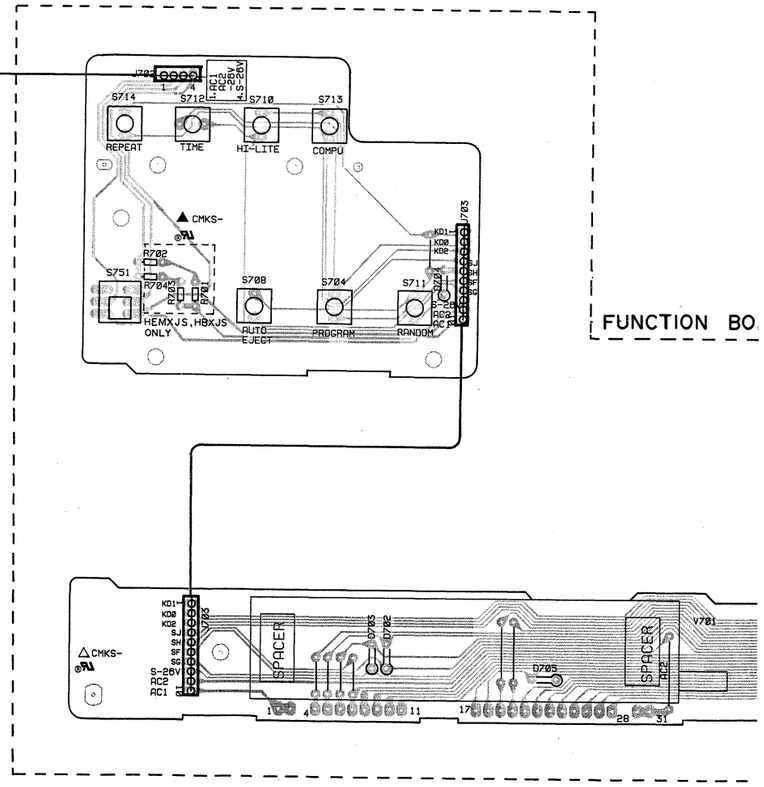
Pin No.	Voltage	Pin No.	Voltage
1	0	25	5.0
2	0	26	0
3	0	27	5.0
4	0	28	0
5	0.2	29	0
6	0	30	NC
7	0.2	31	2.5
8	0	32	2.5
9	0	33	5.0
10	5.0	34	-1.5
11	0	35	-1.7
12	0	36	5.0
13	0	37	-0.7
14	0.2 ~ 0.8	38	-1.6
15	0	39	0
16	-4.0	40	0.8
17	1.3	41	-5.0
18	0	42	0
19	-5.0	43	0
20	5.0	44	0
21	5.0	45	0
22	5.0	46	0
23	5.0	47	0
24	5.0	48	0











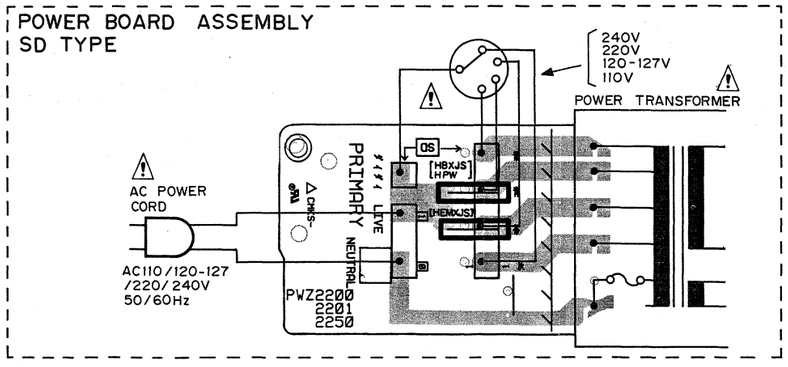
Line Voltage Selection (For HEMXJS, HBXJS and HPW types)

Line voltage can be changed with the following steps.
1. Disconnect the AC power cord.
2. Remove the top cover.
3. Change the position of the jumper wire Ⓐ as follows.

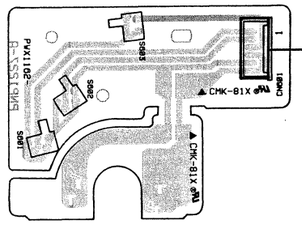
Voltage	Jumper wire Ⓐ position
220V	①
240V	②

4. Stick the line voltage on the rear panel.

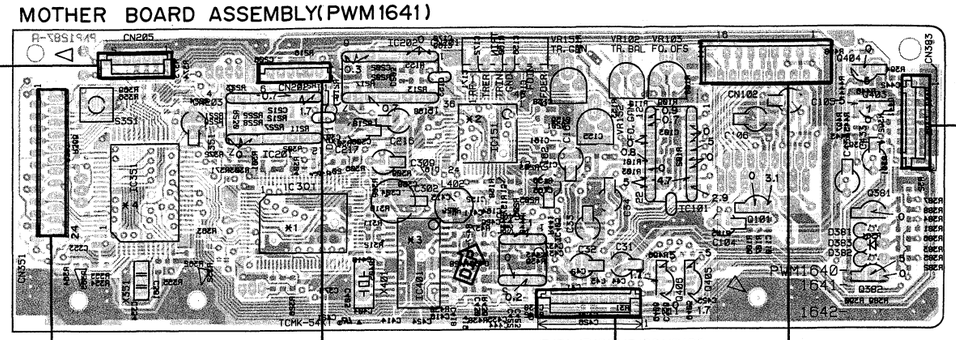
Part No.	Description
AAX-193	220V label
AAX-192	240V label



MECHANISM PCB ASSEMBLY



MOTHER BOARD ASSEMBLY(PWM1641)



IC351 (PD4376A)

Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage	Pin No.	Voltage
1	5.0	17	−16.6	33	4.9	49	0
2	−22.7	18	−26.0	34	3.8 ~ 4.2	50	NC
3	−22.7	19	−5.0	35	4.9	51	5.0
4	−22.7	20	−1.1	36	0	52	5.0
5	−22.7	21	−1.2 ~ −1.1	37	4.9	53	5.0
6	−22.7	22	1.1 ~ 1.6	38	1.2 ~ 2.5	54	5.0
7	−22.7	23	1.8 ~ 1.5	39	0	55	5.0
8	−22.7	24	0.8 ~ 1.5	40	5.0	56	2.3
9	−22.7	25	0.7 ~ 1.2	41	NC	57	2.3
10	NC	26	5.0	42	0	58	0
11	NC	27	−1.0	43	5.0	59	0
12	0	28	−22.0	44	0	60	5.0
13	0	29	−12 ~ −11	45	5.0	61	5.0
14	NC	30	−0.1 ~ −1.1	46	0	62	0
15	NC	31	4.9	47	0	63	5.0
16	−1.0	32	4.8	48	0	64	5.0

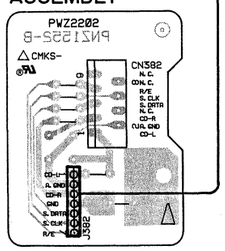
IC401 (TC9237BF)

Pin No.	Voltage	Pin No.	Voltage
1	5.0	15	0
2	0	16	1.9
3	5.0	17	1.9
4	5.5	18	5.0
5	2.5	19	2.0
6	2.5	20	0
7	0	21	0
8	0	22	0
9	2.5	23	0
10	2.5	24	5.0
11	5.0	25	2.5
12	0	26	2.5
13	NC	27	2.5
14	0	28	5.0

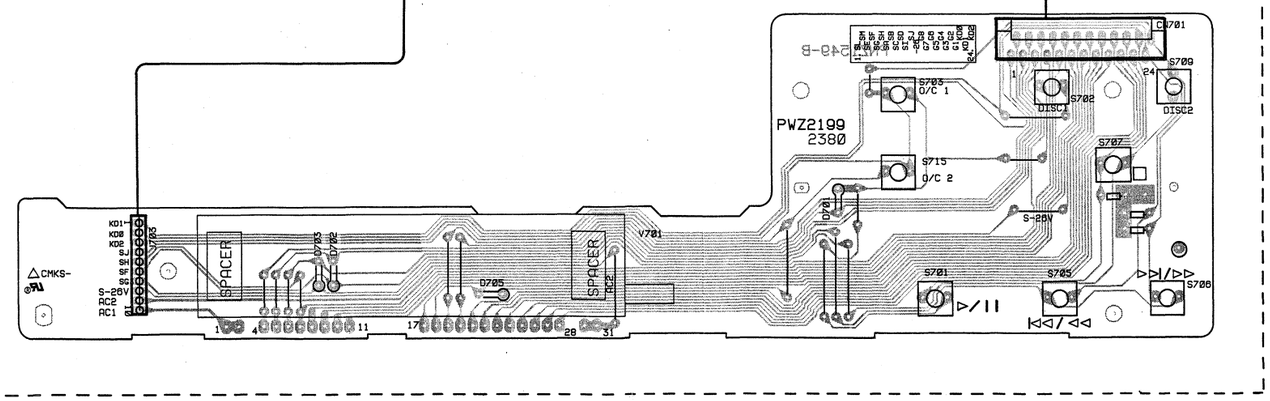
P.C.B. pattern diagram indication	Corresponding part symbol	Part name
		Transistor
		FET
		Diode
		Zenner diode
		LED
		Varactor
		Tact switch
		Inductor
		Coil
		Transformer
		Filter
		Ceramic capacitor
		Mylar capacitor
		Styrol capacitor
		Electrolytic capacitor (Non polarized)
		Electrolytic capacitor (Noiseless)
		Electrolytic capacitor (Polarized)
		Electrolytic capacitor (Polarized)
		Power capacitor
		Semi-fixed resistor
		Resistor array
		Resistor
		Resonator
		Thermistor

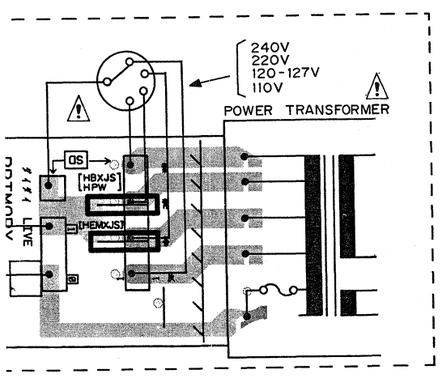
1. This P.C.B. connection diagram is viewed from the parts mounted side.
2. The parts which have been mounted on the board can be replaced with those shown,with the corresponding wiring symbols listed in the above Table.
3. The capacitor terminal marked with ▭ shows negative terminal.
4. The diode marked with ○ shows cathode side.
5. The transistor terminal marked with ▭ shows emitter.

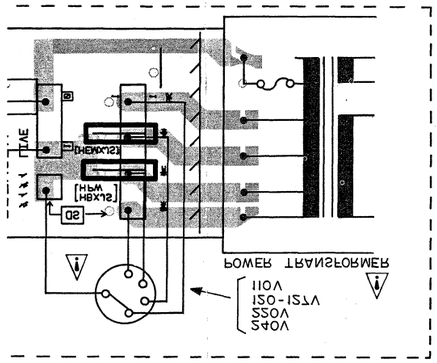
CONNECTOR BOARD ASSEMBLY

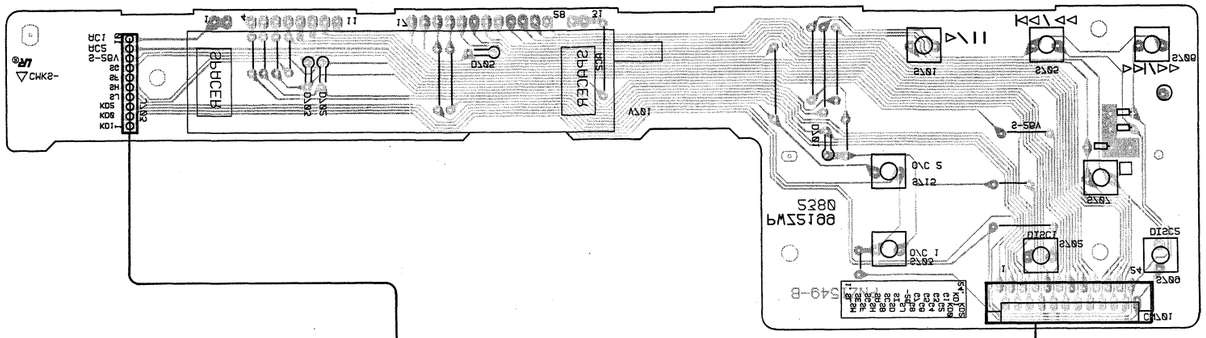


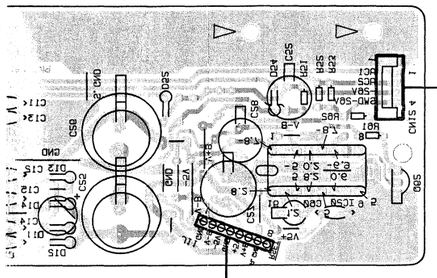
FUNCTION BOARD ASSEMBLY

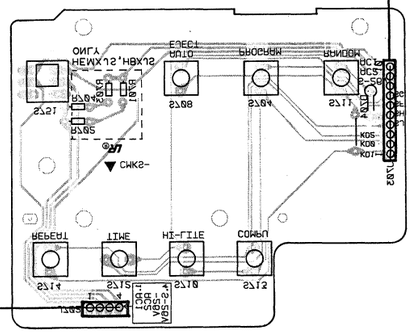




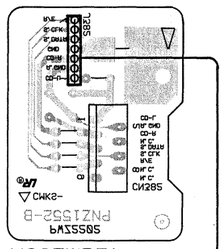








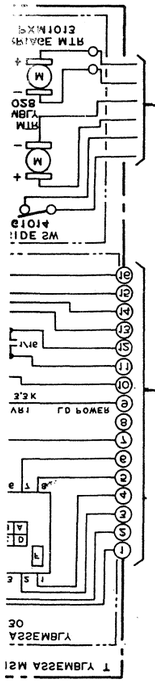
FUNCTION BOARD ASSEMBLY



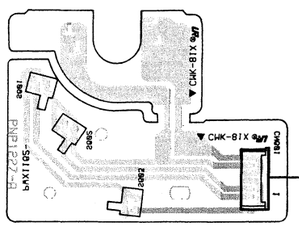
ASSEMBLY
CONNECTOR BOARD

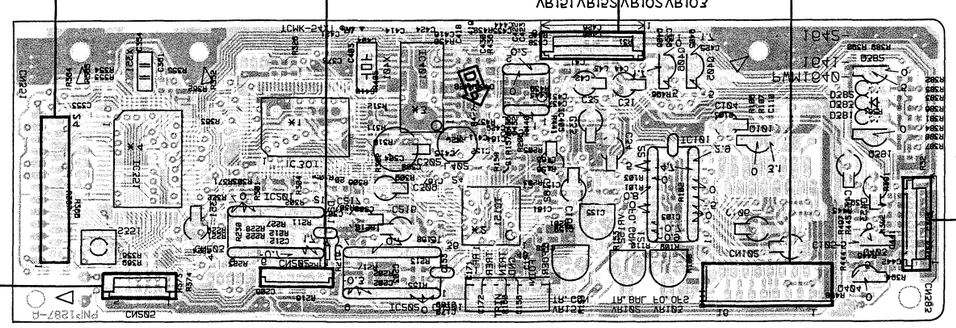
PIN	Voltage	PIN	Voltage	PIN	Voltage	PIN	Voltage
1	0	21	0	41	0	61	0
2	5.2	22	0	42	0	62	0
3	5.2	23	0	43	0	63	0
4	5.2	24	0	44	0	64	0
5	5.2	25	0	45	0	65	0
6	5.2	26	0	46	0	66	0
7	5.2	27	0	47	0	67	0
8	5.2	28	0	48	0	68	0
9	5.2	29	0	49	0	69	0
10	5.2	30	0	50	0	70	0
11	5.2	31	0	51	0	71	0
12	5.2	32	0	52	0	72	0
13	5.2	33	0	53	0	73	0
14	5.2	34	0	54	0	74	0
15	5.2	35	0	55	0	75	0
16	5.2	36	0	56	0	76	0
17	5.2	37	0	57	0	77	0
18	5.2	38	0	58	0	78	0
19	5.2	39	0	59	0	79	0
20	5.2	40	0	60	0	80	0

IC401 (LC863748)



ASSEMBLY
MECHANISM PCB

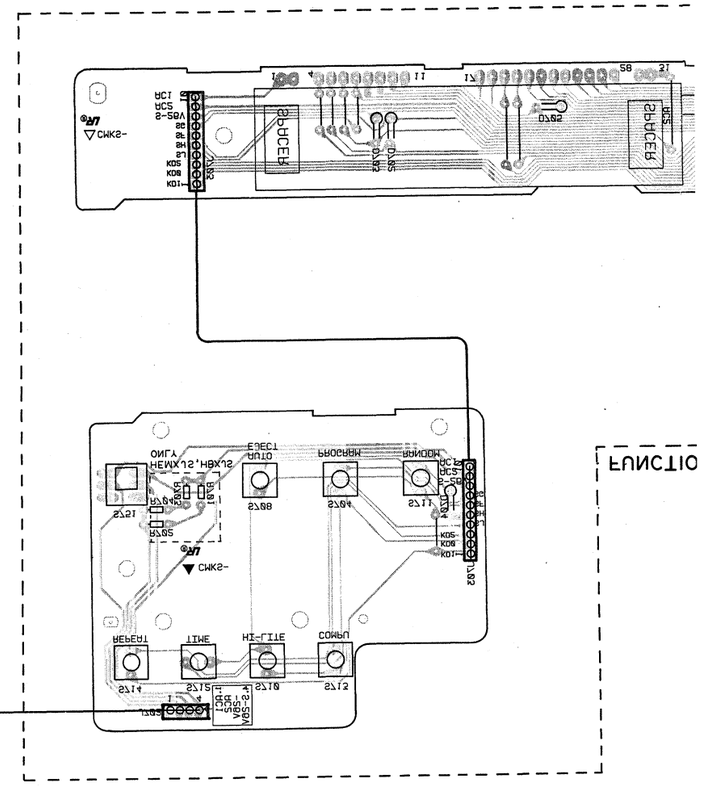




MOTHER BOARD ASSEMBLY(PWM164)

PIN	Voltage	PIN	Voltage	PIN	Voltage	PIN	Voltage
1	0	21	0	41	0	61	0
2	0	22	0	42	0	62	0
3	0	23	0	43	0	63	0
4	0	24	0	44	0	64	0
5	0	25	0	45	0	65	0
6	0	26	0	46	0	66	0
7	0	27	0	47	0	67	0
8	0	28	0	48	0	68	0
9	0	29	0	49	0	69	0
10	0	30	0	50	0	70	0
11	0	31	0	51	0	71	0
12	0	32	0	52	0	72	0
13	0	33	0	53	0	73	0
14	0	34	0	54	0	74	0
15	0	35	0	55	0	75	0
16	0	36	0	56	0	76	0
17	0	37	0	57	0	77	0
18	0	38	0	58	0	78	0
19	0	39	0	59	0	79	0
20	0	40	0	60	0	80	0

IC321 (MD43101)



Test No.	Description
1 – 16	5V Input
17 – 32	5V Input

4. Check the line voltage on the test panel.

Voltage	Jumper wire (A) position
5V	①
5V	②
5V	③

3. Change the position of the jumper wire (A) as follows.
2. Remove the top cover.
1. Disconnect the AC power cord.

Line voltage can be changed with the following steps.

Line Voltage Selection (for HEMX12, HBX12 and PHM types)

• View from soldering side

7. PCB PARTS LIST

NOTES:

- Parts without part number cannot be supplied.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- When ordering resistors, first convert resistance values into code form as shown in the following examples.

Ex.1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%)

560 Ω → 56 × 10^1 → 561 ····· RD1/4PS 5 6 1 J
47k Ω → 47 × 10^3 → 473 ····· RD1/4PS 4 7 3 J
0.5 Ω → 0R5 ····· RN2H 0 R 5 K
1 Ω → 010 ····· RS1P 0 1 0 K

Ex.2 When there are 3 effective digits (such as in high precision metal film resistors).

5.62k Ω → 562 × 10^1 → 5621 ····· RN1/4SR 5 6 2 1 F

Mark	No.	Description	Part No.

LIST OF ASSEMBLIES

⊙	MOTHER BOARD ASSEMBLY	PWM1641
⊙	SUB BOARD ASSEMBLY	PWX1195
	├FUNCTION BOARD ASSEMBLY	
	├POWER BOARD ASSEMBLY	
	└CONNECTOR BOARD ASSSEMBLY	
	MECHANISM PCB ASSEMBLY	

⊙ MOTHER BOARD ASSEMBLY(PWM1641)

SEMICONDUCTORS

	IC101 PRE AMP IC	CXA1471S
	IC151 SERVO IC	CXA1372Q
⚠	IC201, 202 POWER OP-AMP, IC	LA6520
	IC301 EFM DEMODULATION IC	CXD2500AQ
	IC351 MICROCOMPUTER, IC	PD4376A
	IC401	TC9237BF
	IC405 OP-AMP IC	NJM4558D-D
	Q101 TRANSISTOR	2SA854S
	Q381, 382 TRANSISTOR	2SC1740S
	Q403, 404 TRANSISTOR	2SD2144S
	Q405 TRANSISTOR	DTC124ES
	Q406 TRANSISTOR	DTA124ES
	D211 ZENNER DIODE	MTZJ6.2B
	D381-383 DIODE	1SS133X

SWITCHES

	S351 SWITCH	PSG1006

COILS/TRANSFORMERS

	L402 RADIAL INDUCTOR	LFA010K

CAPACITORS

	C31-33 ELECTR. CAPACITOR	CEAS330M16
	C34 ELECTR. CAPACITOR	CEAS471M6R3
	C41-44 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C103 CERAMIC CHIP CAPACITOR	CCSQCH180J50
	C104 ELECTR. CAPACITOR	CEAS101M10
	C105 ELECTR. CAPACITOR	CEAS471M6R3
	C106 ELECTR. CAPACITOR	CEAS101M10
	C110 CERAMIC CHIP CAPACITOR	CKSQYF103Z50
	C155 CERAMIC CHIP CAPACITOR	CKSQYB182K50
	C156 CERAMIC CHIP CAPACITOR	CKSQYB333K25
	C157 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C158, 159	CKSQYB104K25
	C160 ELECTR. CAPACITOR	CEAS4R7M50
	C161	CKSQYB104K25
	C162 ELECTR. CAPACITOR	CEAS010M50
	C163	CKSQYB104K25
	C164 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C167 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C168 CERAMIC CHIP CAPACITOR	CKSQYB333K25
	C169 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C170 CERAMIC CHIP CAPACITOR	CKSQYB332K50
	C171, 172 CERAMIC CHIP CAPACITOR	CKSQYB472K50
	C202 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C206 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C212 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C216, 217 ELECTR. CAPACITOR	CEAS330M16
	C301 CERAMIC CHIP CAPACITOR	CKSQYB104K25
	C302 ELECTR. CAPACITOR	CEAS330M16
	C304 CERAMIC CHIP CAPACITOR	CKSQYB104K25
	C306 CERAMIC CHIP CAPACITOR	CKSQYB152K50
	C307 CERAMIC CHIP CAPACITOR	CKSQYB473K25
	C308 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C309 ELECTR. CAPACITOR	CEASR47M50
	C351 ELECTR. CAPACITOR	CEAS330M16
	C353 CERAMIC CHIP CAPACITOR	CKSQYF103Z50
	C354 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C356 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C361 CERAMIC CHIP CAPACITOR	CKSQYF103Z50
	C375 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C403, 404 CERAMIC CHIP CAPACITOR	CCSQCH470J50
	C410, 411 CERAMIC CHIP CAPACITOR	CKSQYB104K25
	C414-416 CERAMIC CHIP CAPACITOR	CKSQYB104K25
	C418, 419 CERAMIC CHIP CAPACITOR	CKSQYB104K25
	C420 CERAMIC CHIP CAPACITOR	CKSQYB103K50
	C421 CERAMIC CHIP CAPACITOR	CKSQYB473K25

Mark	No.	Description	Part No.
	C422, 423	CERAMIC CHIP CAPACITOR	CKSQYB104K25
	C424	CERAMIC CHIP CAPACITOR	CKSQYB473K25
	C426	CERAMIC CHIP CAPACITOR	CKSQYB473K25
	C429, 430	CERAMIC CHIP CAPACITOR	CCSQCH560J50
	C431, 432	CERAMIC CHIP CAPACITOR	CKSQYB104K25
	C433, 434	ELECTR. CAPACITOR	CEAS220M25
	C435-438	CERAMIC CHIP CAPACITOR	CCSQCH390J50
	C441, 442	CERAMIC CHIP CAPACITOR	CKSQYB152K50
RESISTORS			
	R31, 32	CHIP RESISTOR	RS1/10S□□□J
	R101-111	CHIP RESISTOR	RS1/10S□□□J
	R153-158		RS1/10S□□□J
	R160		RS1/10S□□□J
	R201-203	CHIP RESISTOR	RS1/10S□□□J
	R205, 206		RS1/10S□□□J
	R211, 212	CHIP RESISTOR	RS1/10S□□□J
	R215-219	CHIP RESISTOR	RS1/10S□□□J
	R222	CHIP RESISTOR	RS1/10S□□□J
	R224	CHIP RESISTOR	RS1/10S□□□J
	R227-230		RS1/10S□□□J
	R301-312	CHIP RESISTOR	RS1/10S□□□J
	R326	CHIP RESISTOR	RS1/10S□□□J
	R352-356	CHIP RESISTOR	RS1/10S□□□J
	R362-365	CHIP RESISTOR	RS1/10S□□□J
	R367	CHIP RESISTOR	RS1/10S□□□J
	R371, 372	CHIP RESISTOR	RS1/10S□□□J
	R381-393	CHIP RESISTOR	RS1/10S□□□J
	R405	CHIP RESISTOR	RS1/10S□□□J
	R427-430	CHIP RESISTOR	RS1/10S□□□J
	R435-446	CHIP RESISTOR	RS1/10S□□□J
	R450	CHIP RESISTOR	RS1/10S□□□J
	R496-498	CHIP RESISTOR	RS1/10S□□□J
	VR102	VR	RCP1046
	VR103	VR	RCP1044
	VR151, 152	VR	RCP1046
OTHERS			
	CN102	CONNECTOR	5597-16APB
	CN351	CONNECTOR	HLEM24S-1
	X351	CERAMIC RESONATOR (4.19MHz)	VSS1014
	X401	XTAL RES (OSC) (16.9344MHz)	PSS1006

FUNCTION BOARD ASSEMBLY

SEMICONDUCTORS

	D701-705	DIODE	1SS254

SWITCHES

	S701-715	SWITCH	PSG1006
	S751	SWITCH	PSG1007

RESISTORS

	R701-704	CARBONFILM RESISTOR	RD1/6PM□□□J

OTHERS

	CN701	CONNECTOR	HLEM24R-1
	V701	FL INDICATOR TUBE	PEL1062

Mark	No.	Description	Part No.

POWER BOARD ASSEMBLY

SEMICONDUCTORS

⚠	IC20	REGULATOR IC	M5298P
	Q62	TRANSISTOR	2SC1740S
⚠	D11-14	DIODE	11ES2
⚠	D52	DIODE	11ES2
	D54	ZENNER DIODE	MTZJ18B

CAPACITORS

	C11-16	CERAMIC CAPACITOR	CKCYF103Z50
	C25	ELECTR. CAPACITOR	CEAS472M16
	C26	ELECTR. CAPACITOR	CEAS222M16
	C27	ELECTR. CAPACITOR	CEAS222M6R3
	C28	ELECTR. CAPACITOR	CEAS101M10
	C52	ELECTR. CAPACITOR	CEAS101M35
	C60	ELECTR. CAPACITOR	CEAS010M50

RESISTORS

	R51-53	CARBONFILM RESISTOR	RD1/6PM□□□J
	R61, 62	CARBONFILM RESISTOR	RD1/6PM□□□J

CONNECTOR BOARD ASSEMBLY

OTHERS

	CN382	CONNECTOR (9P)	KPE9

MECHANISM PCB ASSEMBLY

SWITCHES

	S601-603	PUSH SWITCH	DSG1017

8. ADJUSTMENTS

1. Adjustment Methods

If a disc player is adjusted incorrectly or inadequately, it may malfunction or not work at all even though there is nothing at all wrong with the pickup or the circuitry. Adjust correctly following the adjustment procedure.

1-1 Adjustment items/verification items and order

Step	Item	Test point	Adjustment location
1	Focus offset adjustment	TP1, Pin 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Grating adjustment	TP1, Pin 2 (TRK. ERR)	Grating adjustment slit
3	Tracking error balance adjustment	TP1, Pin 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Pickup radial/ tangential direction tilt adjustment	TP1, Pin 1 (RF)	Radial tilt adjustment screw, Tangential tilt adjustment screw
5	RF level adjustment	TP1, Pin 1 (RF)	VR1 (RF level)
6	Focus servo loop gain adjustment	TP1, Pin 5 (FCS. IN) TP1, Pin 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Tracking servo loop gain adjustment	TP1, Pin 3 (TRK. IN) TP1, Pin 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Focus error signal verification	TP1, Pin 6 (FCS. ERR)	———

● **Abbreviation table**

FCS. ERR : Focus Error
FCS. OFS : Focus Offset
TRK. ERR : Tracking Error
TRK. BAL : Tracking Balance
FCS. GAN : Focus Gain
TRK. GAN : Tracking Gain
FCS. IN : Focus In
TRK. IN : Tracking In

1-2 Measuring instruments and tools

1. Dual trace oscilloscope (10:1 probe)
2. Low-frequency oscillator
3. Test disc (YEDS-7)
4. 12-cm disc (with at least about 70 minutes of recording)
5. Low-pass filter (39 kΩ + 0.001 μF)
6. Resistor (100 kΩ)
7. Hex. wrench (L-Shaped type, size: 1.5mm)
8. Standard tools

1-3 Test point and adjustment variable resistor positions

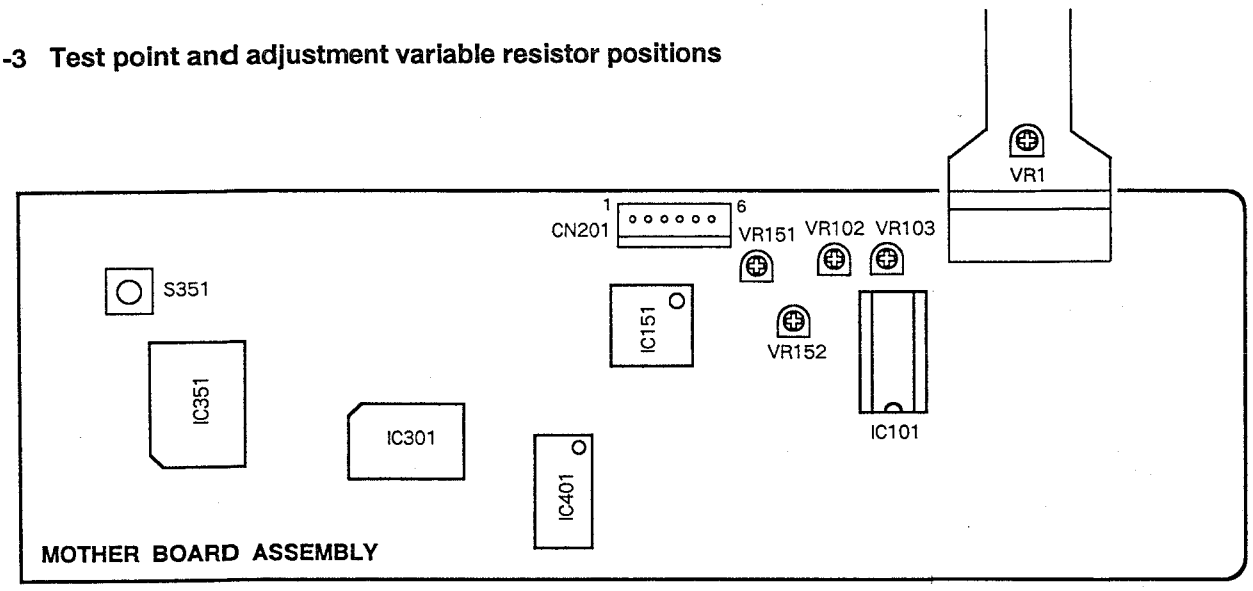


Figure 1 Adjustment Locations

1-4 Notes

1. Use a 10:1 probe for the oscilloscope.
2. All the knob positions (settings) for the oscilloscope in the adjustment procedures are for when a 10:1 probe is used.

1-5 Test mode

These models have a test mode so that the adjustments and checks required for service can be carried out easily. When these models are in test mode, the keys on the front panel work differently from normal. Adjustments and checks can be carried out by operating these keys with the correct procedure. For these models, all adjustments are carried out in test mode.

[Setting these models to test mode]

How to set this model into test mode.
1. Turn off the power switch.
2. Press the switch (S351) for test mode on the main board. (See Figure 1.)
3. Turn on the power switch.

When the test mode is set correctly, the display is different from what it usually is when the power is turned on. If the display is still the same as usual, test mode has not been set correctly, so repeat Steps 1-3.

[Release from test mode]

Here is the procedure for releasing the test mode:
1. Press the STOP key to stop all operations.
2. Turn off the power switch on the front panel.

[Operations of the keys in test mode]

Code	Key name	Function in test mode	Explanation
	PROGRAM	Focus servo close	If Disc Tray 1 is closed, Disk Tray 1 is moved to the play position. Then the laser diode is lit up and the focus actuator is lowered, then raised slowly and the focus servo is closed at the point where the objective lens is focused on the disc. With the player in this state, if you lightly rotate the stopped disc by hand, you can hear the sound the focus servo. If you can hear this sound, the focus servo is operating correctly. If you press this key with no disc mounted, the laser diode lights up, the focus actuator is pulled down, then the actuator is raised and lowered twice and returned to its original position.
▶/❚❚	PLAY/PAUSE	Spindle servo ON	Starts the spindle motor in the clockwise direction and when the disc rotation reaches the prescribed speed (about 500 rpm at the inner periphery), sets the spindle servo in a closed loop. Be careful. Pressing this key when there is no disc mounted makes the spindle motor run at the maximum speed. If the focus servo does not go correctly into a closed loop or the laser light shines on the mirror section at the outermost periphery of the disc, the same symptom is occurred.
▶/❚❚	PLAY/PAUSE	Spindle servo ON Tracking servo close/open	Pressing this key when the focus servo and spindle servo are operating correctly in closed loops puts the tracking servo into a closed loop, displays the track number being played back and the elapsed time on the front panel, and outputs the playback signal. If the elapsed time is not displayed or not counted correctly or the audio is not played back correctly, it may be that the laser is shining on the section with no sound recorded at the outer edge of the disc, that something is out of adjustment, or that there is some other problem. This key is a toggle key and open/close the tracking servo alternately. This key has no effect if no disc is mounted.
⏮/◀◀	MANUAL / TRACK SEARCH REV	Carriage reverse (inwards)	Moves the pickup position toward the inner periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
▶▶/⏭	MANUAL / TRACK SEARCH FWD	Carriage forward (outwards)	Moves the pickup position toward the outer periphery of the disc. When this key is pressed with the tracking servo in a closed loop, the tracking servo automatically goes into an open loop. Since the pickup does not automatically stop at the mechanical end point in test mode, be careful with this operation.
■	STOP	Stop	Switches off all the servos and initializes. The pickup remains where it was when this key was pressed.
	OPEN/CLOSE DISC 1	Disc tray open/close	Opens/closes the disc tray. This key is a toggle key and open/close tray alternately.

[How to play back a disc in test mode]

In test mode, since the servos operate independently, playing back a disc requires that you operate the keys in the correct order to close the servos.
Here is the key operation sequence for playing back a disc in test mode.

PROGRAM	Lights up the laser diode and closes the focus servo.
⇓	
PLAY /PAUSE ►/▮▮	Starts the spindle motor and closes the spindle servo.
⇓	
PLAY /PAUSE ►/▮▮	Closes the tracking servo.

Wait at least 2-3 seconds between each of these operations.

1. Focus offset adjustment

● Objective ● Symptom when out of adjustment	Sets the DC offset for the focus error amp. The player does not focus in and the RF signal is dirty.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 5 mV/division 10 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stopped (just the Power switch on) VR103 (FCS OFS) None needed

[Procedure]

Adjust VR103 (FCS OFS) so that the DC voltage at TP1, Pin 6 (FCS ERR) is –50 ± 50 mV.

2. Grating adjustment

● Objective ● Symptom when out of adjustment	To align the tracking error generation laser beam spots to the optimum angle on the track. Play does not start, track search is impossible, tracks are skipped.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR) via a low pass filter. (See Figure 2) [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open Pickup grating adjustment slit 12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| or REV |◀◀ / ◀◀ key so that the grating adjustment slit is at the outer edge of the disc where it can be adjusted.
2. Press the PROGRAM key, then the PLAY /PAUSE ▶ / ▮▮ key in that order to close the focus servo then the spindle servo.
3. Insert an ordinary screwdriver into the grating adjustment slit and adjust the grating to find the null point. For more details, see the next page.
4. If you slowly turn the screwdriver counterclockwise from the null point, the amplitude of the wave gradually increases, then if you continue turning the screwdriver, the amplitude of the wave becomes smaller again. Turn the screwdriver counterclockwise from the null point and set the grating to the first point where the wave amplitude reaches its maximum.

   Reference: Figure 3 shows the relation between the angle of the tracking beam with the track and the waveform.

   Note: The amplitude of the tracking error signal is about 3 Vp-p (when a 39 kΩ + 0.001 µF low pass filter is used). If this amplitude is extremely small (2 Vp-p or less), then the objective lens or the pickup malfunction may be the cause. If the difference between the amplitude of the error signal at the innermost edge and outermost edge of the disc is more than 10%, the grating is not adjusted to the optimum point, so adjust it again.
5. Return the pickup to more or less midway across the disc with the MANUAL/TRACK SEARCH REV |◀◀ / ◀◀ key, press the PLAY/PAUSE ▶ / ▮▮ key and check that the track number and elapsed time are displayed on the front panel. If they are not displayed at this time or the elapsed time changes irregularly, check the null point and adjust the grating again.

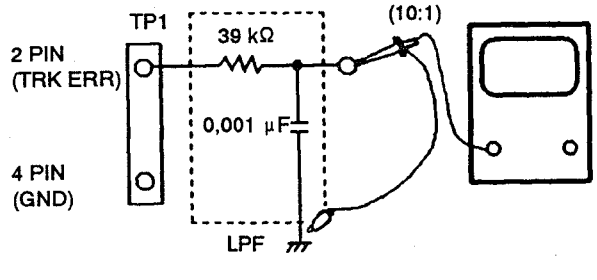
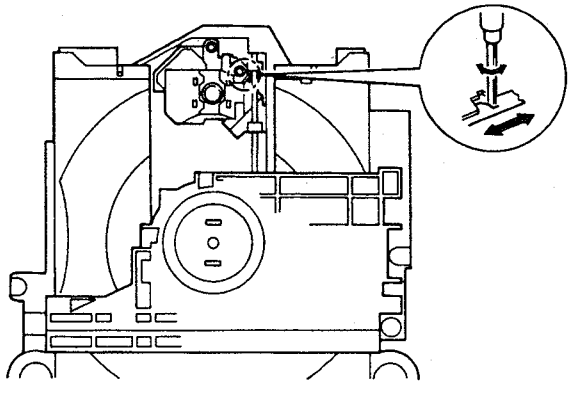


Figure 2



Adjustment Locations

[How to find the null point]

When you insert the screwdriver into the slit for the grating adjustment and change the grating angle, the amplitude of the tracking error signal at TP1 Pin 2 changes. Within the range for the grating, there are five or six locations where the amplitude of the wave reaches a minimum. Of these five or six locations, there is only one at which the envelope of the waveform is smooth. This location is where the three laser beams divided by the grating are all right above the same track. (See Figure 3.)
This point is called the null point. When adjusting the grating, this null point is found and used as the reference position.

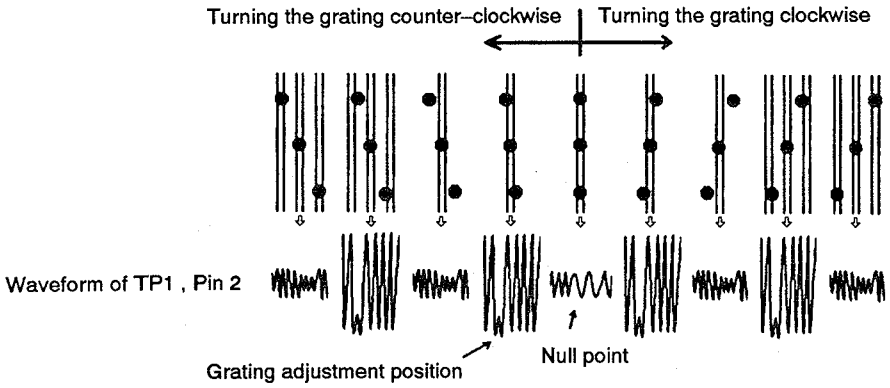
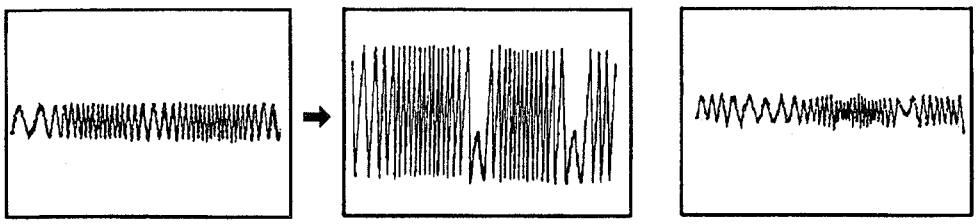


Figure 3



Null point waveform

Maximum amplitude waveform

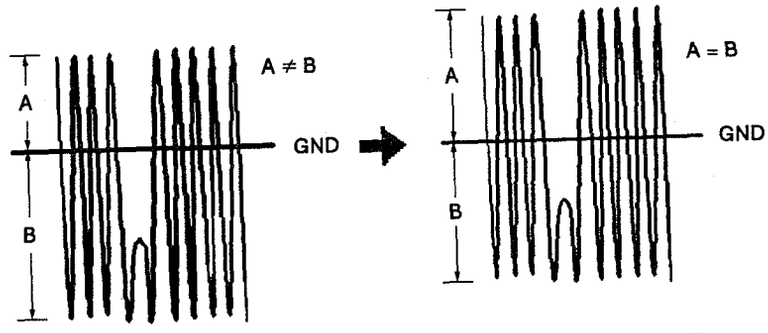
Waveform other than the null point

3. Tracking error balance adjustment

● Objective ● Symptom when out of adjustment	To correct for the variation in the sensitivity of the tracking photodiode Play does not start or track search is impossible		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 2 (TRK ERR). This connection may be via a low pass filter. [Settings] 50 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, focus and spindle servos closed and tracking servo open VR102 (TRK BAL) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| or REV |◀◀ / ◀◀ key.
2. Press the PROGRAM key, then the PLAY/PAUSE ▶ / ▮▮ key in that order to close the focus servo then the spindle servo.
3. Line up the bright line (ground) at the center of the oscilloscope screen and put the oscilloscope into DC mode.
4. Adjust VR102 (TRK BAL) so that positive amplitude and negative amplitude of the tracking error signal at TP1 Pin 2 (TRK ERR) are the same (in other words, so that there is no DC component).



When there is a DC component

When there is no DC component

4. Pickup radial/tangential tilt adjustment

● Objective	To adjust the angle of the pickup relative to the disc so that the laser beams are shone straight down into the disc for the best read out of the RF signals.		
● Symptom when out of adjustment	Sound broken; some discs can be played but not others.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 20 mV/division 200 ns/division AC mode	● Player state	Test mode, play
		● Adjustment location	Pickup radial tilt adjustment screw and tangential tilt adjustment screw
		● Disc	12 cm disc. (YEDS-7 can not be used.)

[Procedure]

1. Move the pickup to the outer edge of the disc with the MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| or REV |◀◀ / ◀◀ key so that the radial/tangential tilt screws can be adjusted.
   Press the PROGRAM key, and do twice the PLAY/PAUSE ▶ / ▮▮ key in that order to close the focus servo then the spindle servo, tracking servo and put the player into play mode.
2. First, adjust the radial tilt adjustment screw with a hex. wrench (L-Shaped type, size: 1.5mm) so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly.
3. Next, adjust the tangential tilt adjustment screw with a hex. wrench (L-Shaped type, size: 1.5mm) so that the eye pattern (the diamond shape at the center of the RF signal) can be seen the most clearly (Figure 5).
4. Adjust the radial tilt adjustment screw and the tangential tilt adjustment screw again so that the eye pattern can be seen the most clearly. As necessary, adjust the two screws alternately so that the eye pattern can be seen the most clearly.

Note: Radial and tangential mean the directions relative to the disc shown in Figure 4.

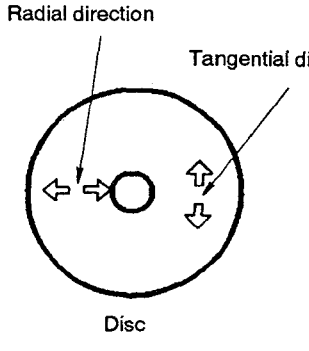
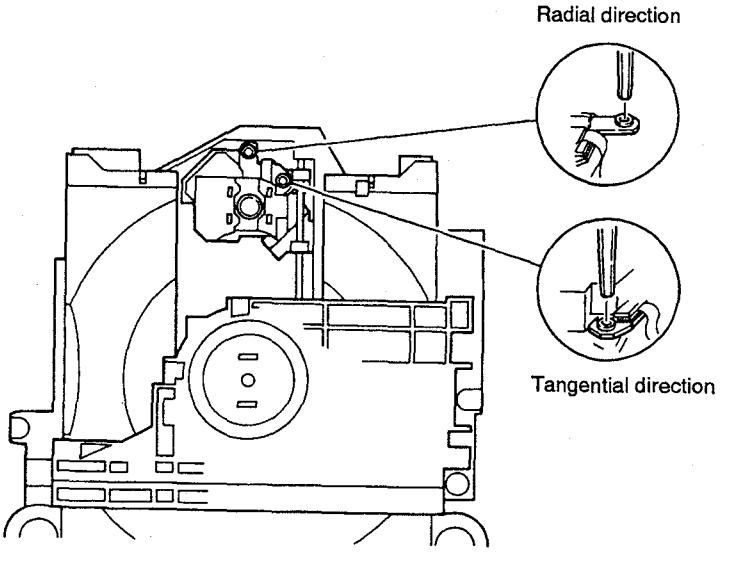


Figure 4



Adjustment Locations

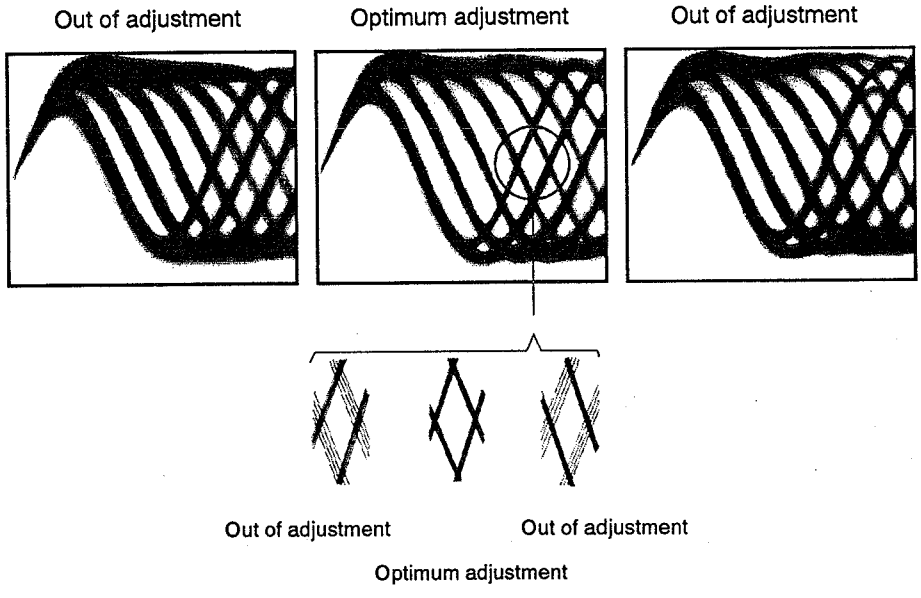


Figure 5 Eye Pattern

5. RF level adjustment

● Objective ● Symptom when out of adjustment	To optimize the playback RF signal amplitude No play or no search		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 1 (RF). [Settings] 50 mV/division 10 ms/division AC mode	● Player state ● Adjustment location ● Disc	Test mode, play VR1 (laser power) YEDS-7

[Procedure]

1. Move the pickup to midway across the disc (R = 35 mm) with the MANUAL/TRACK SEARCH FWD ▶▶/▶▶| or REV |◀◀/◀◀ key, then press the PROGRAM key, and do twice the PLAY/PAUSE ▶/❚❚ key in that order to close the respective servos and put the player into play mode.
2. Adjust VR1 (laser power) so that the RF signal amplitude is 1.2 Vp-p ± 0.1V.

6. Focus servo loop gain adjustment

● Objective	To optimize the focus servo loop gain		
● Symptom when out of adjustment	Playback does not start or focus actuator noisy		
● Measurement instrument connections	See Figure 6. [Settings] CH1 CH2 20 mV/division 5 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR152 (FCS GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 1 Vp-p.
2. Press the MANUAL /TRACK SEARCH FWD ▶▶ / ▶▶| or REV |◀◀ / ◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PROGRAM key, and do twice the PLAY/PAUSE ▶ / ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR152 (FCS GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

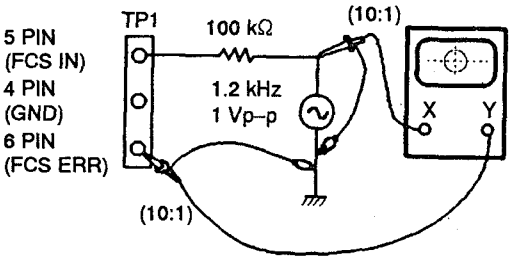
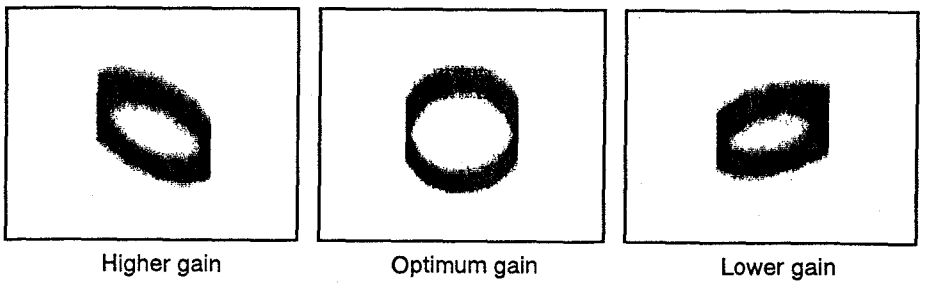


Figure 6

Focus Gain Adjustment



Higher gain | Optimum gain | Lower gain

7. Tracking servo loop gain adjustment

● Objective	To optimize the tracking servo loop gain		
● Symptom when out of adjustment	Playback does not start, during searches the actuator is noisy, or tracks are skipped.		
● Measurement instrument connections	See Figure 7. [Settings] CH1 CH2 50 mV/division 50 mV/division X-Y mode	● Player state ● Adjustment location ● Disc	Test mode, play VR151 (TRK GAN) YEDS-7

[Procedure]

1. Set the AF generator output to 1.2 kHz and 2 Vp-p.
2. Press the MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| or REV ◀◀ / |◀◀ key to move the pickup to halfway across the disc (R = 35 mm), then press the PROGRAM key, and do twice the PLAY/PAUSE ▶ / ▮▮ key in that order to close the corresponding servos and put the player into play mode.
3. Adjust VR151 (TRK GAN) so that the Lissajous waveform is symmetrical about the X axis and the Y axis.

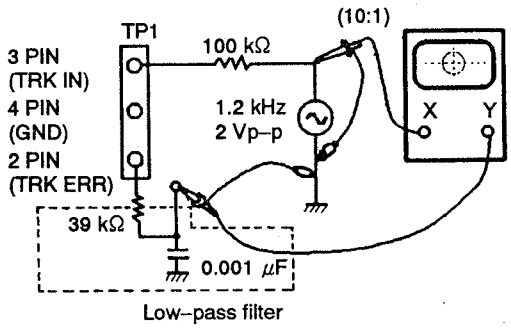
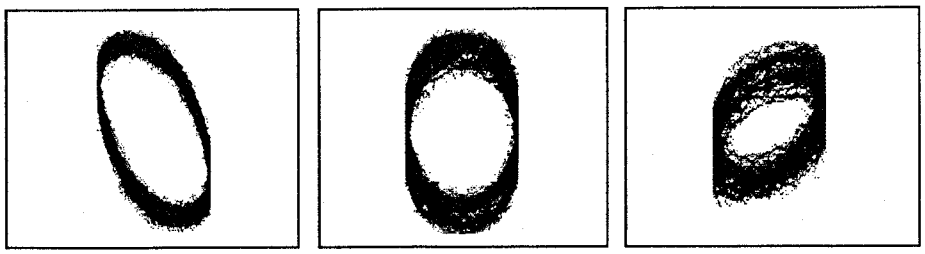


Figure 7

Tracking Gain Adjustment



Higher gain Optimum gain Lower gain

8. Focus error signal (focus S curve) verification

● Objective ● Symptom when out of adjustment	To judge whether the pickup is ok or not by observing the focus error signal. The pickup is judged from the amplitude of the tracking error signal (as discussed in the section on adjusting the tracking error balance) and the wave form for the focus error signal.		
● Measurement instrument connections	Connect the oscilloscope to TP1, Pin 6 (FCS ERR). [Settings] 100 mV/division 5 ms/division DC mode	● Player state ● Adjustment location ● Disc	Test mode, stop None YEDS-7

[Procedure]

1. Connect TP1 Pin 5 to ground.
2. Mount the disc.
3. While watching the oscilloscope screen, press the PROGRAM key and observe the waveform in Figure 8 for a moment. Verify that the amplitude is at least 2.5 Vp-p and that the positive and negative amplitude are about equal. Since the waveform is only output for a moment when the PROGRAM key is pressed, press this key over and over until you have checked the waveform.

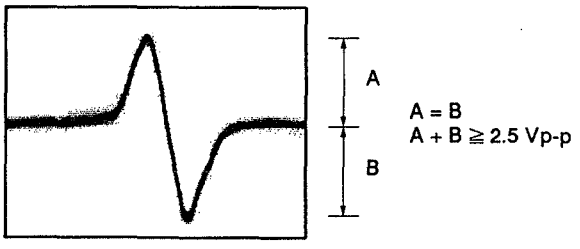


Figure 8

[Judging the pickup]

Do not judge the pickup until all the adjustments have been made correctly. In the following cases, there may be something wrong with the pickup.

1. The tracking error signal amplitude is extremely small (less than 2 Vp-p).
2. The focus error signal amplitude is extremely small (less than 2.5 Vp-p).
3. The positive and negative amplitudes of the focus error signal are extremely asymmetrical (2:1 ratio or more).
4. The RF signal is too small (less than 0.8 Vp-p) and even if VR1 is adjusted (laser power), the RF signal can not be brought up to the standard level.

8. REGLAGE

1. Méthodes de réglage

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

1-1 Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Réglage d'inclinaison radiale/tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP1, Broche 5 (FCS. IN) TP1, Broche 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK. IN) TP1, Broche 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS. ERR)	———

● **Tableau des abbréviations**

FCS. ERR : erreur de mise au point
FCS. OFS : décalage de mise au point
TRK. ERR : erreur d'alignement
TRK. BAL : équilibrage d'erreur d'alignement
FCS. GAN : Gain de mise du point
TRK. GAN: Gain d'alignement
FCS. IN : mise au point correcte
TRK. IN : alignement correct

1-2 Intruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Disque de 12 cm (avec au moins 70 minutes d'enregistrement)
5. Filtre passe-bas (39 kΩ + 0,001 μF)
6. Résistance (100 kΩ)
7. Six pans droite (L-forme, dimension: 1,5 mm)
8. Outils conventionnels

1–3 Point d'essai et positions de réglage de la résistance variable

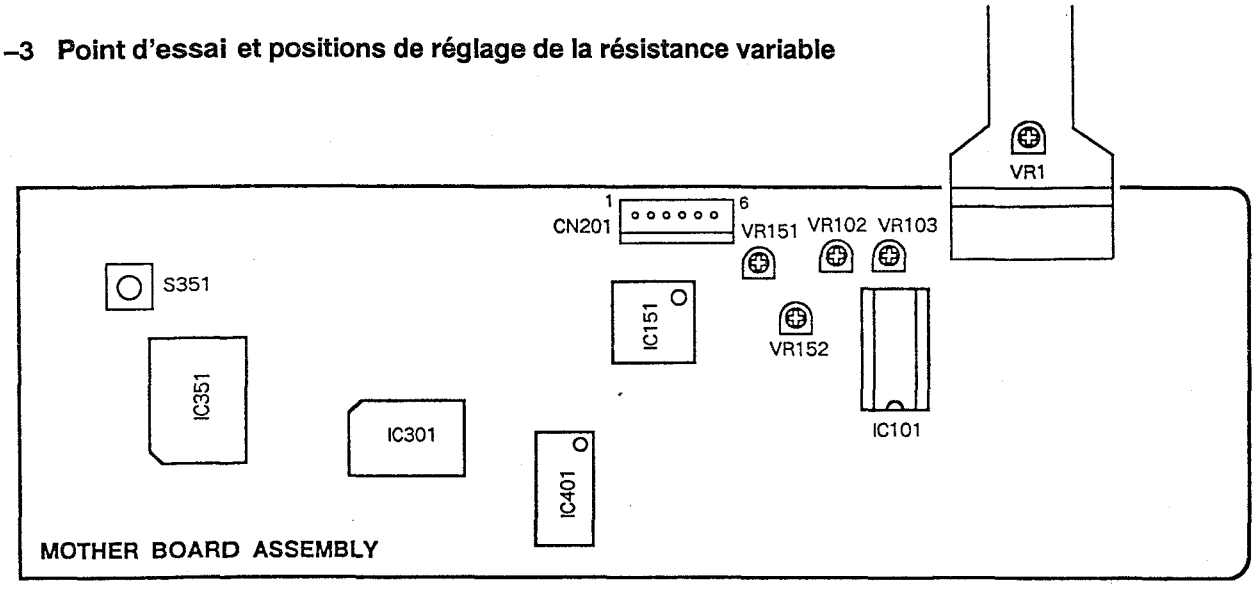


Figure 1 Emplacement des Réglages

1–4 Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

1–5 Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.
1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Appulyer sur le commutateur (S351) de mode d'essai sur la plaquette principale.(voir Figure 1.)
3. Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

8. REGLAGE

1. Méthodes de réglage

Si le lecteur CD est mal réglé, il risque de ne plus fonctionner normalement, voire ne plus fonctionner du tout, même si le capteur et la circuiterie en présentent aucune anomalie. Par conséquent, ajuster le lecteur correctement en suivant les démarches de réglage.

1–1 Points de réglage/Point et ordre de vérification

Etape	Point	Point d'essai	Emplacement du réglage
1	Réglage du décalage de la mise au point	TP1, Broche 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Réglage du réseau de diffraction	TP1, Broche 2 (TRK. ERR)	Fente de réglage du réseau de diffraction
3	Réglage d'équilibrage d'erreur d'alignement	TP1, Broche 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Réglage d'inclinaison radiale/tangentielle du capteur	TP1, Broche 1 (RF)	Vis de réglage d'inclinaison radiale, Vis de réglage d'inclinaison tangentielle
5	Réglage du niveau RF	TP1, Broche 1 (RF)	VR1 (niveau RF)
6	Réglage de gain de boucle asservie de la mise au point	TP1, Broche 5 (FCS. IN) TP1, Broche 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Réglage de gain de boucle asservie de l'alignement	TP1, Broche 3 (TRK. IN) TP1, Broche 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Vérification du signal d'erreur de la mise au point	TP1, Broche 6 (FCS. ERR)	———

● **Tableau des abbréviations**

FCS. ERR : erreur de mise au point
FCS. OFS : décalage de mise au point
TRK. ERR : erreur d'alignement
TRK. BAL : équilibrage d'erreur d'alignement
FCS. GAN : Gain de mise du point
TRK. GAN: Gain d'alignement
FCS. IN : mise au point correcte
TRK. IN : alignement correct

1–2 Intruments de mesure et outils

1. Oscilloscope cathodique à deux faisceaux (sonde 10:1)
2. Oscillateur de basse fréquence
3. Disque d'essai (YEDS-7)
4. Disque de 12 cm (avec au moins 70 minutes d'enregistrement)
5. Filtre passe-bas (39 kΩ + 0,001 μF)
6. Résistance (100 kΩ)
7. Six pans droite (L-forme, dimension: 1,5 mm)
8. Outils conventionnels

1–3 Point d'essai et positions de réglage de la résistance variable

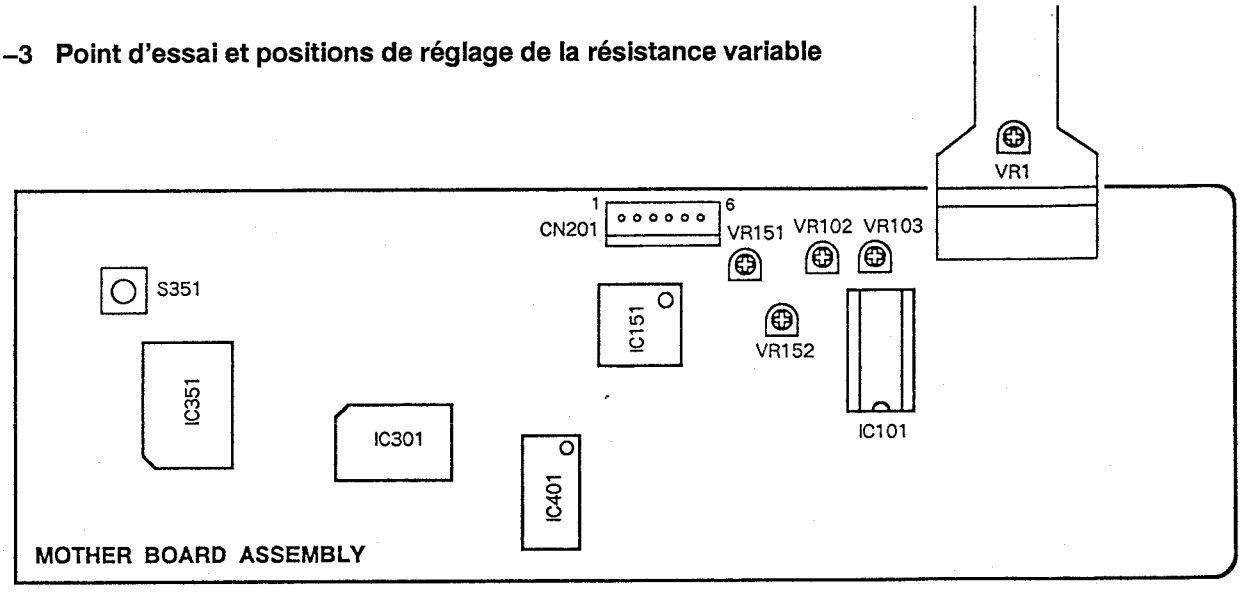


Figure 1 Emplacement des Réglages

1–4 Remarques

1. Utiliser une sonde 10:1 pour l'oscilloscope.
2. Toutes les positions (réglages) des boutons de l'oscilloscope, dans les démarches de réglage, sont conçues pour l'usage d'une sonde 10:1.

1–5 Mode d'essai

Ces modèles sont munis d'un mode d'essai, de façon que les réglages requis à la réparation puissent être effectués aisément. Quand ces modèles sont en mode d'essai, les touches du panneau avant ne fonctionnent pas comme à l'ordinaire. Les réglages et les vérifications peuvent s'effectuer par l'enclenchement de ces touches, à conditions de suivre les démarches requises. Dans le cas de ces modèles, tous les réglages sont réalisés en mode d'essai.

[Mise en mode d'essai]

Voici la manière de mettre le modèle en mode d'essai.
1. Commuter l'interrupteur d'alimentation sur arrêt.
2. Appulyer sur le commutateur (S351) de mode d'essai sur la plaquette principale.(voir Figure 1.)
3. Commuter l'interrupteur d'alimentation sur marche.

Quand le mode d'essai est correctement réglé, l'affichage est différent de celui qui apparaît généralement à la mise sous tension. Si l'affichage reste le même, le mode d'essai n'a pas été réglé correctement. Dans ce cas, répéter les étapes 1 à 3.

[Pour sortir du mode d'essai]

Voici la procédure pour sortir du mode d'essai.

1. Appuyer sur la touche STOP pour arrêter toutes les opérations.
2. Sur le panneau avant, commuter l'interrupteur d'alimentation sur arrêt.

[Fonctionnement des touches en mode d'essai]

	PROGRAMME	Fermeture du circuit asservi de la mise au point	Si le plateau n ° 1 est fermé, il se place en mode de lecture. Ensuite la diode laser s'allume et l'actuateur de la mise au point s'abaisse, puis se relève lentement et le circuit servo de la mise au point se ferme au point où la lentille de l'objectif se focalise sur le disque. Quand l'appareil est dans cet état, si l'on fait légèrement tourner à la main le disque arrêté, le bruit produit par le circuit servo de la mise au point sera audible. Si ce bruit est perçu, le circuit servo de la mise au point fonctionne correctement. Si cette touche est enclenchée et qu'aucun disque n'est installé, la diode laser s'allume, l'actuateur de la mise au point s'abaisse, se relève, puis s'abaisse une deuxième fois et enfin, revient à sa position de départ.
►/❚❚	PLAY/PAUSE	Asservissement de rotation en service	Démarre le moteur de rotation dans le sens des aiguilles d'une montre, quand la rotation du disque atteint la vitesse prescrite (environ 500 tours/min à la circonférence interne) et place le circuit servo de rotation dans une boucle fermée. Attention. Si cette touche est enfoncée et qu'un disque n'est pas installé, le moteur de rotation va tourner á la vitesse maximum. Si le circuit servo de la mise au point ne passe pas comme prévu dans une boucle fermée ou que la diode laser brille dans le miroir à la périphérie externe du disque, le même symptôme se produit.
►/❚❚	PLAY/PAUSE	Asservissement de rotation en service Ouverture/Fermeture du circuit servo de l'alignement	Le fait d'appuyer sur cette touche quand le circuit servo de la mise au point et de la rotation fonctionnent correctement en boucles fermées, place le circuit servo de l'alignement dans une boucle fermée, fait apparaître, sur le panneau avant, le numéro de la piste en cours de lecture et la durée écoulée, puis sort le signal de lecture. Si la durée écoulée n'est pas affichée ou n'est pas correctement calculée, ou si la reproduction sonore est anormale, il se peut que la diode laser s'active dans la section dépourvue de signaux enregistrés, au bord externe du disque, qu'un ajustement quelconque soit déréglé, ou qu'un autre problème se manifeste. Cette touche est de type à bascule et ouvre/ferme alternativement le circuit servo de l'alignement. Cette touche est inopérante si un disque n'est pas installé.
⏮/◄◄	MANUAL /TRACK SEARCH REV	Inversion du chariot (vers l'intérieur)	Déplace le capteur vers la périphérie interne du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
►►/⏭	MANUAL /TRACK SEARCH REV	Inversion du chariot (vers l'extérieur)	Déplace le capteur vers la périphérie externe du disque. Quand cette touche est enclenchée et que le circuit servo de l'alignement travaille en boucle fermée, celui-ci change automatiquement dans une boucle ouverte. Comme le capteur ne s'arrête pas automatiquement au point de fin mécanique du mode d'essai, effectuer cette démarche avec précaution.
■	STOP	Arrêt	Met tous les circuits servo hors service et les initialise. Le capteur reste là où il était quand cette touche a été enclenchée.
	OPEN/CLOSE DISC 1	Ouverture/Fermeture	Cette touche est de type à bascule et ouvre/ferme alternativement le plateau. Le fait d'enfoncer cette touche quand le plateau est ouvert le ferme et vice versa.

[Lecture de disque en mode d'essai]

En mode d'essai, comme les circuits servo fonctionnent de manière indépendante, la lecture d'un disque exige que les touches soient enclenchées dans l'ordre prescrit, afin de fermer les circuits servo.
Voici l'ordre d'enclenchement des touches pour reproduire un disque en mode d'essai.

PROGRAM	Allume la diode laser et ferme le circuit servo de la mise au point.
⇓	
PLAY/PAUSE ►/❚❚	Démarre le moteur de rotation et ferme le circuit servo de la rotation.
⇓	
PLAY/PAUSE ►/❚❚	Ferme le circuit servo de l'alignement.

Attendre 2 à 3 secondes entre chaque opération.

1. Réglage du décalage de la mise au point

<table>
<tr><td>● Objectif
● Symptôme quand déréglé</td><td colspan="3">Règle le décalage CC de l'amplificateur d'erreur de mise au point.
Le lecteur ne procède plus à la mise au point et le signal RF n'est pas clair.</td></tr>
<tr><td>● Raccordement des instruments de mesure</td><td>Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR).

[Réglages] 5 mV/division
10 ms/division
mode CC</td><td>● Etat du lecteur

● Emplacement du réglage

● Disque</td><td>Mode d'essai, arrêté
(juste l'interrupteur d'alimentation commuté sur marche)

VR103 (FCS OFS)

Aucun requis</td></tr>
<tr><td colspan="4">[Marche à suivre]
Ajuster VR103 (FCS OFS) de façon que la tension à TP1 broche 6 (FCS ERR) soit –50 ± 50 mV.</td></tr>
</table>

2. Réglage du réseau de diffraction

● Objectif	Pour aligner les points du rayon laser producteur d'erreur d'alignement sur l'angle optimum de la piste.		
● Symptôme quand déréglé	La lecture ne commence pas, la recherche de piste est impossible, les pistes sont sautées.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR) via un filtre passe-bas. (Voir Figure 2) [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert
		● Emplacement du réglage	Fente de réglage du réseau de diffraction du capteur
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche MANUAL /TRACK SEARCH FWD ▶▶ / ▶▶| ou la touche REV |◀◀ / ◀◀, de façon que la fente de réglage du réseau de diffraction se situe sur bord extérieur du disque, où elle peut être réglée.
2. Appuyer sur la touche PROGRAM, puis sur la touche PLAY/PAUSE ▶ / ▮▮, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Insérer un tournevis ordinaire dans le réseau de diffraction pour trouver le point zéro. Pour plus de détails, voir page suivante.
4. Si l'on tourne lentement le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro, l'amplitude de l'onde augmente graduellement et si l'on continue à tourner le tournevis, l'amplitude de l'onde diminue de nouveau. Tourner le tournevis dans le sens contraire des aiguilles d'une montre à partir du point zéro et régler le réseau de diffraction au premier point où l'amplitude de l'onde atteint son maximum.

   Référence: La Figure 3 illustre la relation entre l'angle du faisceau de l'alignement et la piste et la forme d'onde.

   Remarque: L'amplitude du signal d'erreur d'alignement se situe aux environs de 3 Vc-c (quand un filtre passe-bas de 39 kΩ + 0,001 µF est utilisé). Si cette amplitude est extrêmement petite (2 Vc-c ou moins), il peut s'ensuivre un mauvais fonctionnement de la lentille d'objectif oude capteur. Si la différence entre l'amplitude du signal d'erreur au bord le plus intérieur et au bord le plus extérieur du disque est supérieure à 10%, ceci signifie que le réseau de diffraction n'est pas réglé à son point optimum. Dans ce cas, recommencer le réglage.
5. Replacer le capteur plus ou moins à mi-chemin sur le disque par la touche MANUAL/TRACK SEARCH REV |◀◀ / ◀◀, appuyer sur la touche PLAY/PAUSE ▶ / ▮▮ et vérifier que le numéro de piste et la durée écoulée sont affichés sur le panneau avant. Si ces paramètres n'apparaissent pas ce moment, ou que la durée écoulée change de manière irrégulière, vérifier le point zéro et recommencer le réglage du réseau de diffraction.

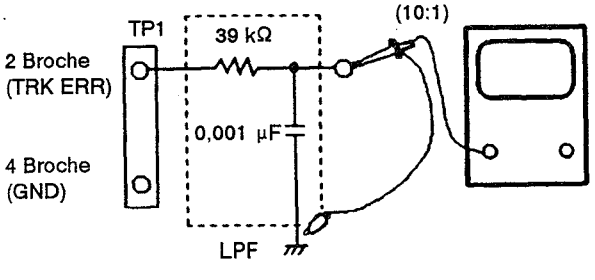
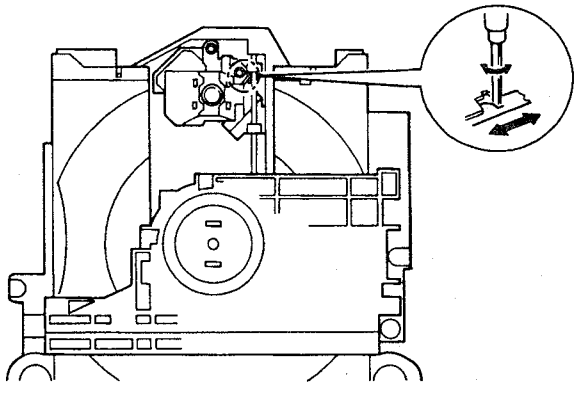


Figure 2



Emplacement des Réglages

[Repérage du point zéro]

Quand le tournevis est introduit dans la fente de réglage du réseau de diffraction et que l'angle du réseau de diffraction est modifié, l'amplitude du signal d'erreur d'alignement à TP1, broche 2, change. Dans les limites de la plage du réseau de diffraction, il existe six emplacements où l'amplitude de l'onde atteint le minimum. Mais l'enveloppe de la forme d'onde n'est régulière qu'à un seul de ces emplacements. Ce point se situe à l'endroit où les trois rayons laser, divisés par le réseau de diffraction, se situent exactement sur la même piste (voir Figure 3).
Ce point s'appelle le point zéro. Lors du réglage du réseau de diffraction, ce point zéro est repéré et utilisé comme position de référence.

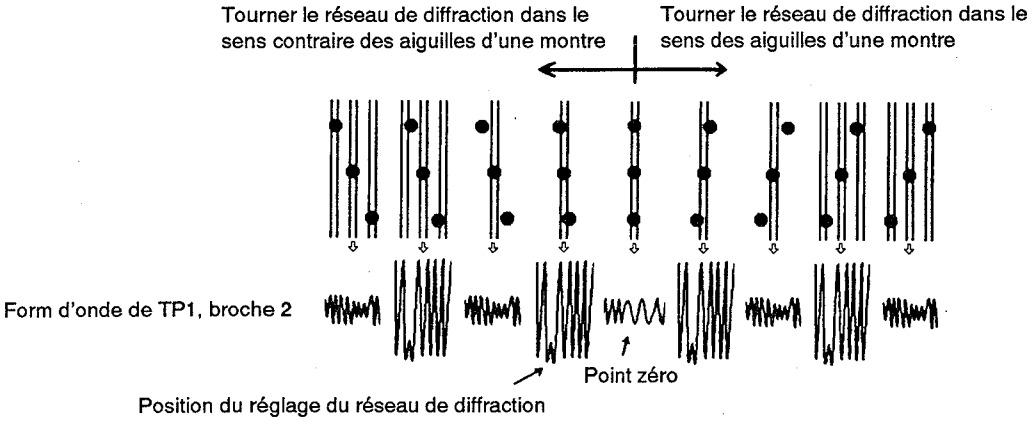
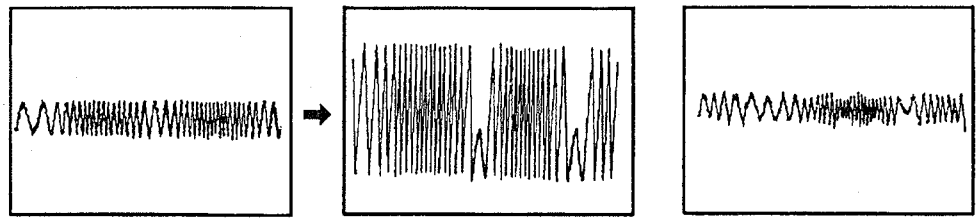

Tourner le réseau de diffraction dans le sens contraire des aiguilles d'une montre
Tourner le réseau de diffraction dans le sens des aiguilles d'une montre
Form d'onde de TP1, broche 2
Point zéro
Position du réglage du réseau de diffraction

Figure 3



Forme d'onde du point zéro

Forme d'onde d'amplitude maximum

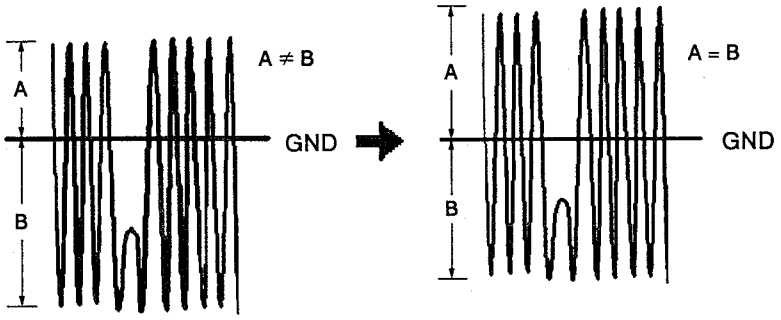
Forme d'onde autre que du point zéro

3. Réglage d'équilibrage d'erreur d'alignement

● Objectif ● Symptôme quand déréglé	Pour corriger la variation de sensibilité de la photodiode d'alignement La lecture ne commence pas, la recherche de piste est impossible.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 2 (TRK ERR). Cette connexion peut être faite par l'interm'ediaire d'un filtre passe–bas. [Réglages] 50 mV/division 5 ms/division mode CC	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, circuits servo de la mise au point et de la rotation fermés, circuit servo de l'alignement ouvert VR102 (TRK BAL) YEDS-7

[Marche à suivre]

1. Déplacer le capteur à mi-chemin sur le disque (R = 35 mm) par la touche MANUAL/TRACK SEARCH FWD▶▶ /▶▶| ou REV|◀◀ /◀◀.
2. Appuyer sur la touche PROGRAM, puis sur la touche PLAY/PAUSE ▶ /❚❚, dans cet ordre, pour fermer le circuit servo de la mise au point, puis celui de la rotation.
3. Aligner la ligne lumineuse (masse) au centre de l'écran de l'oscilloscope et placer celui-ci en mode CC.
4. Ajuster VR102 (TRK BAL) de façon que l'amplitude positive et l'amplitude négative du signal d'erreur d'alignement à TP1, broche 2 (TRK ERR) soient identiques (c'est-à-dire, qu'il n'y ait aucun composant CC).



S'il y a un composant CC　　S'il n'y a pas de composant CC

4. Réglage d'inclinaison radiale/tangentielle du capteur

● Objectif	Pour régler l'angle du capteur par rapport au disque, de façon que les rayons laser frappent verticalement le disque et permettre ainsi la lecture optimum des signaux RF.		
● Symptôme quand déréglé	Son interrompu; certains disques peuvent être lus et pas d'autres.		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF). [Réglages] 20 mV/division 200 ns/division mode CA	● Etat du lecteur	Mode d'essai, lecture
		● Emplacement du réglage	Vis de réglage d'inclinaison radiale Vis de réglage d'inclinaison tangentielle
		● Disque	Disque de 12 cm. (Il est impossible d'employer le disque YEDS-7).

[Marche à suivre]

1. Déplacer le capteur sur le bord externe du disque par la touche MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| ou REV |◀◀ / ◀◀, de façon que les vis de réglage d'inclinaison radiale et tangentielle puissent être réglées.
   Appuyer sur la touche PROGRAM, puis deux fois sur la touche PLAY/PAUSE ▶ / ❚❚ dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecture.
2. D'abord, ajuster la vis d'inclinaison radiale six pans droite (L-forme, dimension: 1,5 mm), de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible.
3. Ensuite, ajuster la vis d'inclinaison tangentielle six pans droite (L-forme, dimension: 1,5 mm), de façon que le motif en oeil (c'est-à-dire, le diamant au centre du signal RF) soit le plus clairement visible (Figure 5).
4. Ajuster de nouvear la vis d'inclinaison radiale et la vis d'inclinaison tangentielle de façon que le motif en oeil soit le plus clairement visible. Le cas échéant, régler les deux vis de façon que le motif en oeil soit le plus clairement visible.

   Remarque: "Radial" et "tangentiel" se rapportent aux sens par rapport au disque illustré à la Figure 4.

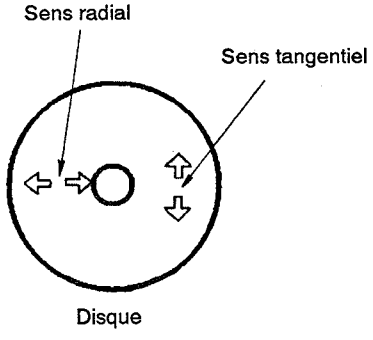
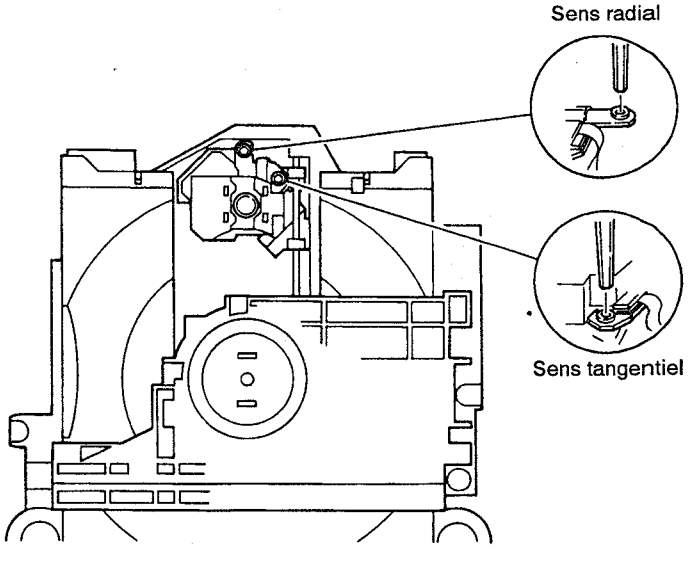


Figure 4



Emplacements des Réglages

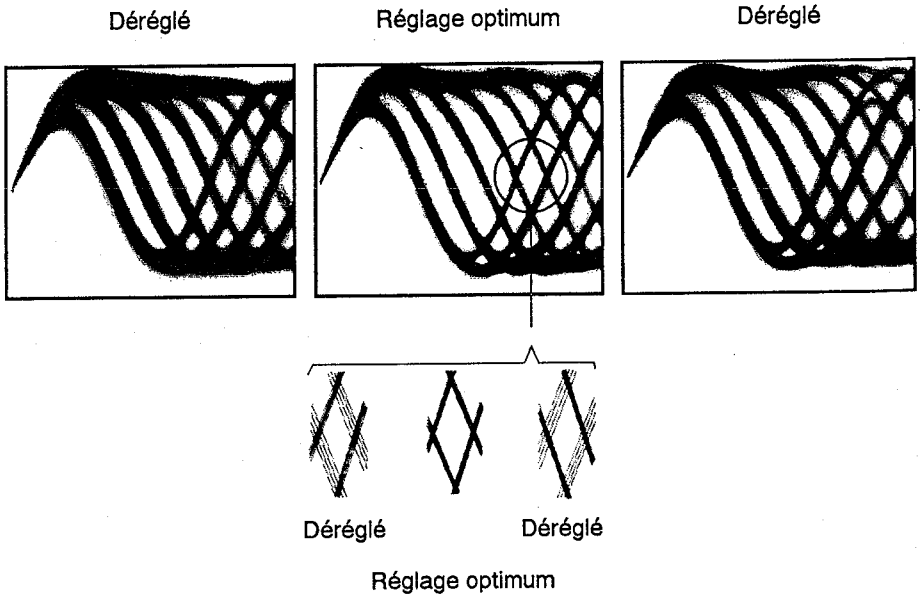


Figure 5 Motif en oeil

5. Réglage du niveau RF (niveau RF)

● Objectif	Pour optimaliser l'amplitude du signal RF de lecture		
● Symptôme quand déréglé	Pas de lecture ni de recherche		
● Raccordement des instruments de mesure	Raccorder l'oscilloscope à TP1, broche 1 (RF) [Rélages] 50 mV/division 10 ms/division mode CA	● Etat du lecteur	Mode d'essai, lecture
		● Emplacement du réglage	VR1 (alimentation du laser)
		● Disque	YEDS-7

[Marche à suivre]

1. Placer le capteur à mi-chemin sur le disque (R = 35 mm) à l'aide de la touche MANUAL /TRACK SEARCH FWD ▶▶ / ▶▶| ou REV |◀◀ / ◀◀. Ensuite, appuyer sur la touche PROGRAM, puis deux fois sur la touche PLAY/PAUSE ▶ / ▮▮ dans cet ordre, pour fermer les circuits servo respectifs et mettre le lecteur en mode de lecteur.
2. Ajuster VR1 (alimentation du laser) de façon que l'amplitude du signal RF atteigne 1,2 Vc-c ± 0,1V.

6. Réglage de gain de boucle asservie de la mise au point

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de la mise au point.		
● Symptôme quand déréglé	La lecture ne commence pas ou l'actuateur de la mise au point est parasité.		
● Raccordement des instruments de mesure	Voir Figure 6 [Réglages] CAN. 1 CAN. 2 20 mV/division 5 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR152 (FCS GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche MANUAL/TRACK SEARCH FWD ▶▶ /▶▶| ou la touche REV |◀◀ /◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PROGRAM, puis deux fois sur la touche PLAY/PAUSE ▶/❚❚ dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR152 (FSC GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

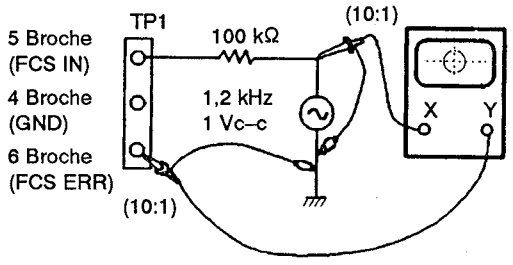
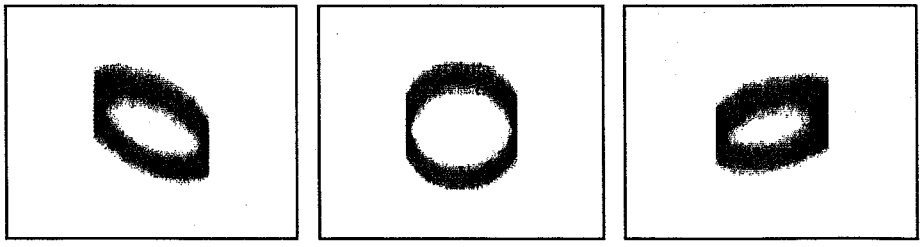


Figure 6

Adjustment de gain de mise au point



Gain supérieur Gain optimum Gain inférieur

7. Réglage de gain de boucle asservie de l'alignement

● Objectif	Pour optimaliser le gain de la boucle d'asservissement de l'alignement.		
● Symptôme quand déréglé	La lecture ne commence pas, l'actuateur est parasité pendant la recherche, ou des pistes sont sautées.		
● Raccordement des instruments de mesure	Voir Figure 7 [Réglages] CAN. 1 CAN. 2 50 mV/division 50 mV/division Mode X-Y	● Etat du lecteur ● Emplacement du réglage ● Disque	Mode d'essai, lecture VR151 (TRK GAN) YEDS-7

[Marche à suivre]

1. Régler la sortie du générateur AF sur 1,2 kHz et 1 Vc-c.
2. Appuyer sur la touche MANUAL/TRACK SEARCH FWD ▶▶/▶▶| ou la touche REV |◀◀/◀◀ pour placer le capteur à mi-chemin sur le disque (R = 35 mm). Ensuite, appuyer sur la touche PROGRAM, puis deux fois sur la touche PLAY/PAUSE ▶/❚❚ dans cet ordre, pour fermer les circuits servo respectifs et placer le lecteur en mode de lecture.
3. Ajuster VR151 (TRK GAN) de façon que la forme d'onde de Lissajous soit symétrique aux alentours de l'axe X et l'axe Y.

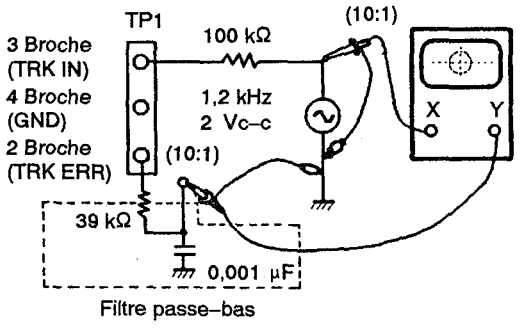
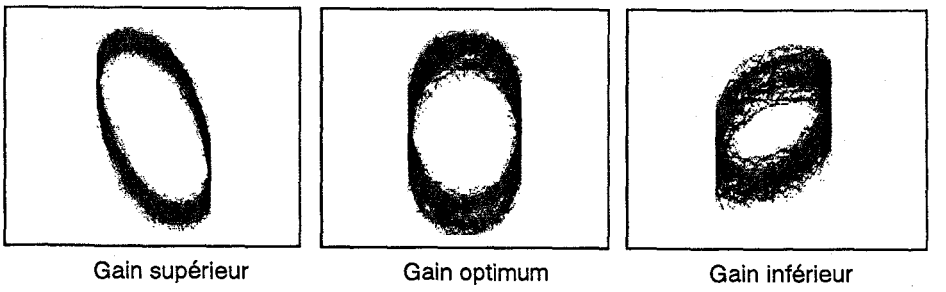


Figure 7

Adjustment de gain d'alignement



Gain supérieur | Gain optimum | Gain inférieur

8. Vérification du signal d'erreur de la mise au point

<table>
<tr><td>● Objectif

● Symptôme quand déréglé</td><td colspan="3">Pour juger si le capteur est bon ou pas, en observant le signal d'erreur de la mise au point. L'état du capteur s'évalue à partir de l'amplitude du signal d'erreur d'alignement (comme décrit dans le paragraphe relatif à l'équilibrage d'erreur d'alignement), ainsi qu'à partir de la forme d'onde du signal d'erreur de mise au point.</td></tr>
<tr><td>● Raccordement des instruments de mesure</td><td>Raccorder l'oscilloscope à TP1, broche 6 (FCS ERR).

[Réglages] 100 mV/division
5 ms/division
mode CC</td><td>● Etat du lecteur

● Emplacement du réglage

● Disque</td><td>Mode de test, arrêt

Aucun

YEDS-7</td></tr>
</table>

[Marche à suivre]

1. Raccorder TP1, broche 5 à la masse.
2. Installer le disque.
3. Tout en regardant l'écran de l'oscilloscope, appuyer sur la touche PROGRAM et observer la forme d'onde de la Figure 8, pendant quelques instants.Vérifier que l'amplitude atteint au moins 2,5 Vc-c et que les amplitudes positive et négatives soient égales. Comme la forme ne sort que pour un moment, quand la touche PROGRAM est enclenchée, appuyer sur à plusieurs reprises sur cette touche, jusqu'à ce que la forme d'onde ait été vérifiée.

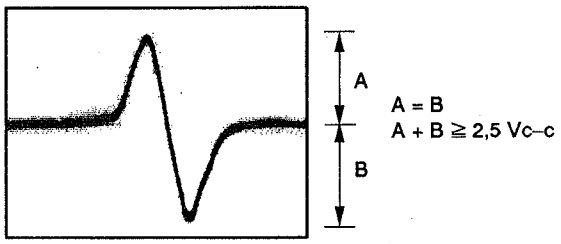


Figure 8

[Evaluation du capteur]

Ne pas tenter d'évaluer l'état du capteur tant que tous les réglages ne sont pas corrects. Les cas suivants témoignent de l'anomalie du capteur.

1. L'amplitude du signal d'erreur d'alignement est extrêmement petite (inférieure à 2 Vc-c).
2. L'amplitude du signal d'erreur de mise au point est extrêmement petite (inférieure à 2,5 Vc-c).
3. Les amplitudes positive et négative du signal d'erreur de mise au point sont extrêmement asymétriques (taux 2:1 ou plus).
4. Le signal RF est trop petit (inférieur à 0,8 Vc-c) et même si VR1 (alimentation du laser) est ajustée, le signal RF ne peut être élevé au niveau standard.

8. AJUSTE

1. Métodos de ajuste

Si un reproductor de discos compactos se ajusta incorrecta o inadecuadamente, puede funcionar mal o no trabajar incluso aunque no exista ningún problema en el captor ni en los circuitos. Ajuste correctamente siguiendo el procedimiento de ajuste.

1-1 Ítemes de ajuste/verificación y orden

Paso	Ítem	Punto de prueba	Lugar de ajuste
1	Ajuste del descentramiento de enfoque	TP1, Patilla 6 (FCS. ERR)	VR103 (FCS. OFS)
2	Ajuste de retícula	TP1, Patilla 2 (TRK. ERR)	Ranura de ajuste de retícula
3	Ajuste del equilibrio de ajuste de seguimiento	TP1, Patilla 2 (TRK. ERR)	VR102 (TRK. BAL)
4	Ajuste de la inclinación en sentido radial/tangencial del captor	TP1, Patilla 1 (RF)	Tornillo de ajuste de la inclinación radial Tornillo de ajuste de la inclinación tangencial
5	Ajuste del nivel de RF	TP1, Patilla 1 (RF)	VR1 (Nivel de RF)
6	Ajuste de la ganancia del bucle del servo de enfoque	TP1, Patilla 5 (FCS. IN) TP1, Patilla 6 (FCS. ERR)	VR152 (FCS. GAN)
7	Ajuste de la ganancia del bucle del servo de seguimiento	TP1, Patilla 3 (TRK. IN)) TP1, Patilla 2 (TRK. ERR)	VR151 (TRK. GAN)
8	Verificación de la señal de error de enfoque	TP1, Patilla 6 (FCS. ERR)	———

● **Tabla de abreviaturas**

FCS. ERR : Error de enfoque
FCS. OFS : Descentramiento de enfoque
TRK. ERR : Error de seguimiento
TRK. BAL : Equilibrio de seguimiento
FCS. GAN : Ganacia de enfoque
TRK. GAN : Ganacia de seuimiento
FCS. IN : Entrada de enfoque
TRK. IN : Entrada de seguimiento

1-2 Instrumentos y herramientas de medición

1. Osciloscopio de doble traza (Sonda de 10:1)
2. Oscilador de baja frecuencia
3. Disco de prueba (YEDS-7)
4. Disco de 12 cm (con 70 minutos de grabación por lo menos)
   Para el tipo de reproducción múltiple de disco compacto, emplee solamente el disco de prueba YEDS-7.
5. Filtro de paso bajo (39 kΩ + 0,001 μF)
6. Resistor (100 kΩ)
7. Llave hexagonal recta (en forma de "L", tamaño: 1,5 mm)
8. Herramientas estándar

1-3 Ubicación de los puntos de prueba y los resistores variables de ajuste

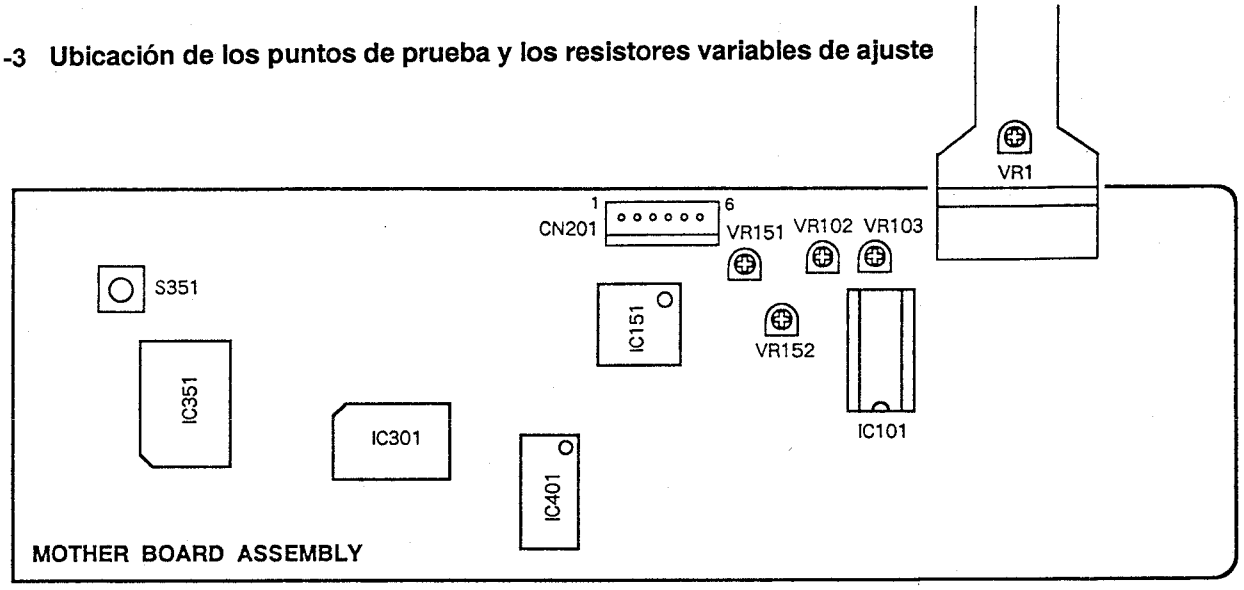


Figura 1 Lugares de Ajuste

1-4 Notas

1. Emplee una sonda de 10:1 para el osciloscopio.
2. Todas las posiciones de los mandos (ajustes) para el osciloscopio de los procedimientos de ajuste son para cuando se emplee la sonda de 10:1.

1-5 Modo de prueba

Estos modelos poseen un modo de prueba que permite realizar fácilmente los ajustes y las comprobaciones requeridos para el servicio. Cuando estos modelos estén en el modo de prueba, las teclas del panel frontal trabajarán de forma diferente a la normal. Los ajustes y las comprobaciones podrán realizarse accionando estas teclas de acuerdo con el procedimiento correcto. Para estos modelos, todos los ajustes se realizarán en el modo de prueba.

[Puesta de estos modelos en el modo de prueba]

A continuación se indica cómo poner estos modelos en el modo de prueba.
1. Ponga en OFF el interruptor de alimentación.
2. Oprima el interruptor (S351) para el modo de prueba que se encuentra en el panel principal (Consulte la figura 1.)
3. Ponga en ON el interruptor de alimentación.

Cuando haya ajustado correctamente el modo de prueba, la visualización será diferente a la obtenida normalmente al conectar la alimentación. Si la visualización sigue siendo la normal, el modo de prueba no se habrá ajustado normalmente, por lo que tendrá que repetir los pasos 1 a 3.

[Desactivación del modo de prueba]

A continuación se indica el procedimiento para desactivar el modo de prueba.
1. Presione la tecla STOP y cese todas las operaciones.
2. Ponga en OFF el interruptor de alimentación del panel frontal.

[Operaciones de teclas en el modo de prueba]

Código	Nombre de la tecla	Función en el modo de prueba	Explicación
	PROGRAMA	Cierre del servo de enfoque	Si la bandeja de disco 1 está cerrada, ésta se moverá hasta la posición de reproducción. Después el diodo láser se encenderá y el actuador de enfoque descenderá, después se elevará lentamente, y el servo de enfoque se cerrará en el punto en el que el objetivo se enfoque sobre el disco. Con el reproductor en este estado, si gira ligeramente con la mano el disco parado podrá oír el sonido del servo de enfoque. Si puede oír este sonido, el servo de enfoque estará funcionando correctamente. Si presiona esta tecla sin disco montado, el diodo láser se encenderá, el actuador de enfoque se verá empujado hacia abajo, y después se levantará y descenderá dos veces, y volverá a su posición original.
▶/❚❚	PLAY/PAUSE	Activación del servo del eje	Pondrá en marcha el motor del eje haciéndolo girar hacia la derecha y después la rotación del disco alcanzará la velocidad prescrita (unas 500 rpm en la periferia interior), y pondrá el servo del eje en un bucle cerrado. Tenga cuidado. Si presiona esta tecla cuando no haya disco montado, el motor del eje girará a la velocidad máxima. Si el servo de enfoque no pasa correctamente a un bucle cerrado, o si el haz lasérico incide en la sección del espejo en el la periferia del disco, ocurrirá el mismo síntoma.
▶/❚❚	PLAY/PAUSE	Activación del servo del eje Apertura/cierre del servo de seguimiento	Si presiona esta tecla cuando el servo de enfoque y el servo del eje están funcionando correctamente en bucles cerrados, el servo de sequimiento se pondrá en bucle cerrado, en el panel frontal se visualizarán el número de canción que esté reproduciéndose y el tiempo transcurrido, y se producirá la salida de la señal de reproducción. Si el tiempo transcurrido no se visualiza o no se cuenta correctamente, o si el sonido no se reproduce correctamente, es posible que el rayo lasérico esté incidiendo en la sección sin sonido grabado en el borde exterior del disco, o que exista algún otro problema. Esta tecla es basculante (de acción alternativa) y abre/cierra el servo de seguimiento alternativamente. Esta tecla no funcionará cuando no haya disco montado.
⏮/◀◀	MANUAL/ TRACK SEARCH REV	Retroceso del carro (hacia adentro)	Moverá la posición del captor hacia el diámetro interior del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
▶▶/⏭	MANUAL/ TRACK SEARCH FWD	Avance del carro (hacia afuera)	Moverá la posición del captor hacia la periferia del disco. Si presiona esta tecla con el servo de seguimiento en bucle cerrado, dicho bucle pasará automáticamente a bucle abierto. Como el captor no se para automáticamente en el punto final mecánico en el modo de prueba, tenga cuidado cuando realice esta operación.
■	STOP	Parada	Desactivará todos los servos e inicializará la unidad. El captor permanecerá donde estaba cuando se presionó esta tecla.
	OPEN/CLOSE DISC1	Apertura/cierre de la bandeja del disco	Abrirá/cerrará la bandeja del disco. Esta tecla es basculante (de acción alternativa) y abre/cierra la bandeja alternativamente.

[Cómo reproducir un disco en el modo de prueba]

En el modo de prueba, como los servos funcionan independientemente, la reproducción de un disco requiere el que usted emplee las teclas en el orden correcto para cerrar los servos.
A continuación se indica la secuencia de operación de teclas para reproducir un disco en el modo de prueba.

PROGRAM — Hará que se encienda el diodo láser y cerrará el servo de enfoque.

⇓

PLAY/PAUSE ▶/❚❚ — Pondrá en marcha el motor del eje y hará que se cierre el servo del eje.

⇓

PLAY/PAUSE ▶/❚❚ — Cerrará el servo de seguimiento.

Espere de 2 a 3 segundos por lo menos entre cada una de estas operaciones.

1. Ajuste del descentramiento del enfoque

● Objetivo ● Síntomas en caso de desajuste	Ajuste de la tensión de CC para el amplificador de error de enfoque. El reproductor no enfoca y la señal de RF contiene perturbaciones.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 5 mV/división 10 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parado (con el interruptor de alimentación en ON) VR103 (FCS OFS) No es necesario

[Procedimiento]

Ajuste VR103 (FCS OFS) de forma que la tensión de CC de TP1, patilla 6, (FCS ERR) sea de −50 ± 50 mV.

2. Ajuste de retícula

● Objetivo	Alineación de los puntos del haz lasérico de generación de error de seguimiento al ángulo óptimo en la pista.		
● Síntomas en caso de desajuste	La reproducción no se inicia, la búsqueda de canciones es imposible, las pistas se saltan.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR) a través de un filtro de paso bajo. (Consulte la figura 2) [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto Ranura de ajuste de retícula del captor Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| o REV |◀◀ / ◀◀ de forma que la ranura de ajuste de la retícula quede en el borde exterior del disco, donde puede ajustarse.
2. Presione la tecla PROGRAM, y después la tecla PLAY/PAUSE ▶ / ▮▮, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Inserte un destornillador normal en la ranura de ajuste de la retícula y ajuste la retícula hasta encontrar el punto nulo.
   Para más detalles, consulte la página siguiente.
4. Si gira lentamente el destornillador hacia la izquierda desde el punto nulo, la amplitud de la onda aumentará gradualmente. Después, si continúa girando el destornillador, la amplitud de la onda se volverá otra vez más pequeña. Gire el destornillador hacia la izquierda desde el punto nulo y ajuste la retícula al primer punto en el que la amplitud de la onda alcance su valor máximo.

   Referencia: En la figura 3 se muestra la relación entre el ángulo del haz de seguimiento con la pista y la forma de onda.

   Nota: La amplitud de la señal de error de seguimiento será de aproximadamente 3 Vp-p (cuando se emplee un filtro de paso bajo de 39 kΩ , 0,001 µF). Si esta amplitud es extremadamente pequeña (2 Vp-p o menos), la causa será el funcionamiento malo en el lente objetivo o en el captador. Si la diferencia entre la amplitud de la señal de error en el borde interior y exterior del disco es superior al 10%, la retícula no estará ajustada al punto óptimo, por lo que tendrá que volver
5. Devuelva el captor hasta la mitad más o menos del disco con la tecla MANUAL/TRACK SEARCH REV |◀◀ / ◀◀, presione la tecla PLAY/PAUSE ▶ / ▮▮, y vuelva a comprobar si en el panel frontal se visualizan el número de canción y el tiempo transcurrido. Si no se visualizan esta vez, o si el tiempo transcurrido cambia irregularmente, vuelva a comprobar el punto nulo y ajuste otra vez la retícula.

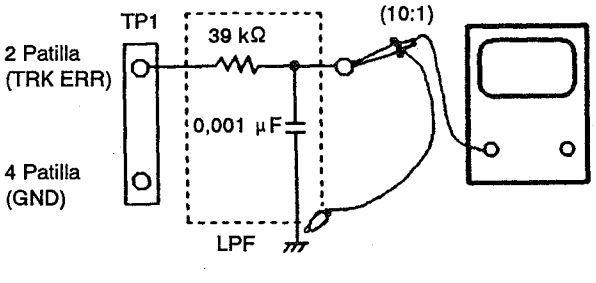
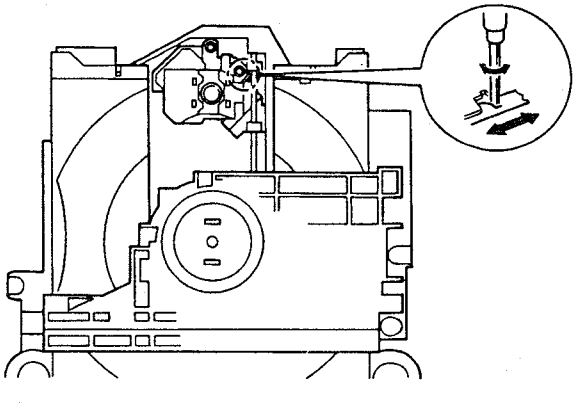


Figura 2



Lugares de Ajuste

[Cómo encontrar el punto nulo]

Cuando inserte el destornillador normal en la ranura para el ajuste de la retícula y cambie el ángulo de la misma. La amplitud de la señal de error de seguimiento de TP1, patilla 2, cambiará. Dentro del margen para la retícula existen cinco o seis lugares en los que la amplitud alcanza el valor mínimo. De estos cinco o seis lugares, solamente hay uno en el que la envolvente de la forma de onda es uniforme. Este lugar es donde los tres haces lasércicos divididos por la retícula se encuentran exactamente sobre la misma pista. (Consulte la figura 3.) Este punto se denomina punto nulo. Cuando ajuste la retícula, este punto se encontrará y empleará como posición de referencia.

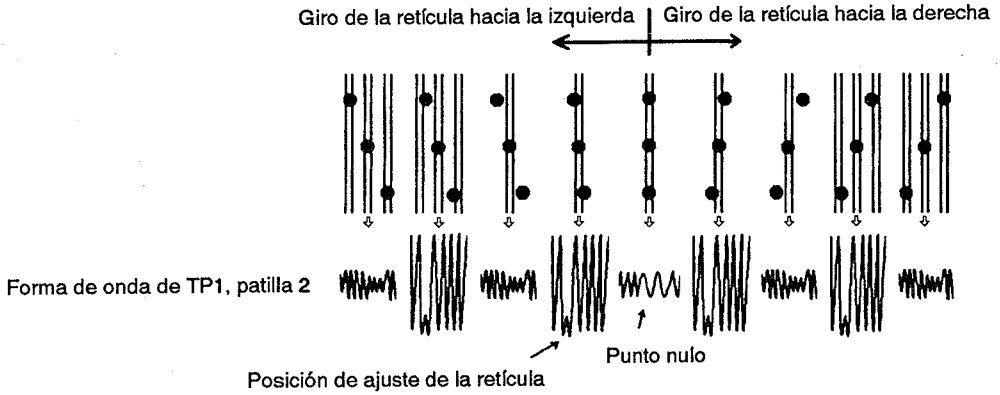
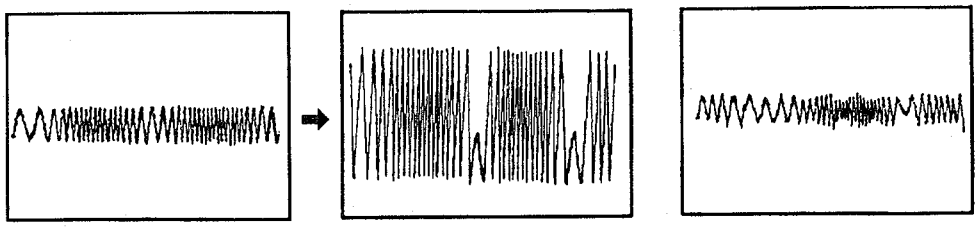

Giro de la retícula hacia la izquierda
Giro de la retícula hacia la derecha
Forma de onda de TP1, patilla 2
Punto nulo
Posición de ajuste de la retícula

Figura 3



Forma de onda del punto nulo

Forma de onda de amplitud máxima

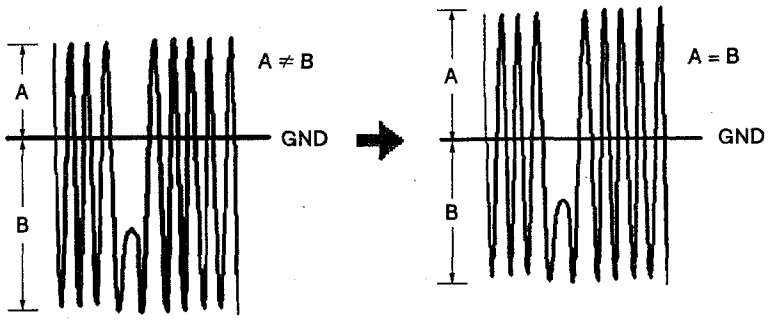
Forma de onda que no es el punto nulo

3. Ajuste del equilibrio de error de seguimiento

● Objetivo	Corrección de la variación de la sensibilidad del fotodiodo de seguimiento		
● Síntomas en caso de desajuste	La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 2, (TRK ERR). Esta conexión puede realizarse a través de un filtro de paso bajo. [Ajustes] 50 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, servos de enfoque y del eje cerrados, y servo de seguimiento abierto VR102 (TRK BAL) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| o REV |◀◀ / ◀◀.
2. Presione la tecla PROGRAM, y después la tecla PLAY/PAUSE ▶ / ❚❚, por este orden, a fin de cerrar el servo de enfoque y después el servo del eje.
3. Haga coincidir la línea brillante (masa) del centro de la pantalla del osciloscopio y ponga éste en el modo de CC.
4. Ajuste VR102 (TRK BAL) de forma que la amplitud positiva y la negativa de la señal de error de seguimiento de TP1, patilla 2, (TRK ERR) sean iguales (en otras palabras, de forma que no haya componente de CC).



Cuando hay componente de CC

Cuando no hay componente de CC

4. Ajuste de la inclinación en sentido radial/tangencial del captor

● Objetivo	Ajustar el ángulo del captor en relación con el disco de forma que los haces lasércicos incidan perpendicularmente sobre el mismo a fin de poder leer con la mayor exactitud las señales de RF.		
● Síntomas en caso de desajuste	Sonido quebrado, algunos discos pueden reproducirse pero otros no.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 20 mV/división 200 ns/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción Tornillo de ajuste de la inclinación radial y tornillo de ajuste de la inclinación tangencial Disco de 12 cm. (El disco YEDS-7 no podrá emplearse.)

[Procedimiento]

1. Mueva el captor hasta el borde exterior del disco con la tecla MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| o REV |◀◀ / ◀◀ de forma que puedan ajustarse los tornillos de inclinación radial/tangencial.
   Presione la tecla PROGRAM, y después la tecla PLAY/PAUSE ▶ / ❚❚, dos veces en dicho orden, a fin de cerrar los servos rispectivos, y ponga el reproductor en el modo de reproducción.
2. En primer lugar, gire el tornillo de ajuste de inclinación radial con una llave hexagonal recta (en forma de "L", tamaño: 1,5 mm) hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad.
3. A continuación, ajuste el tornillo de ajuste de inclinación tangencial con una llave hexagonal recta (en forma de "L", tamaño: 1,5 mm) hasta que el patrón ocular (la forma de diamante del centro de la señal de RF) pueda verse con la mayor claridad (figura 5).
4. Vuelva a girar el tornillo de ajuste de inclinación radial y el tornillo de inclinación tangencial hasta que el patrón ocular pueda verse con la mayor claridad. Si es necesario, ajuste alternativamente los dos tornillos hasta que el patrón ocular pueda verse con la mayor claridad.

Nota: Radial y tangencial significan las direcciones en relación con el disco mostrado en la figura 4.

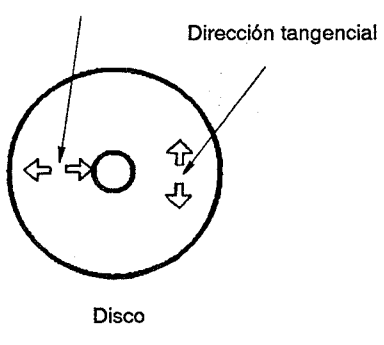
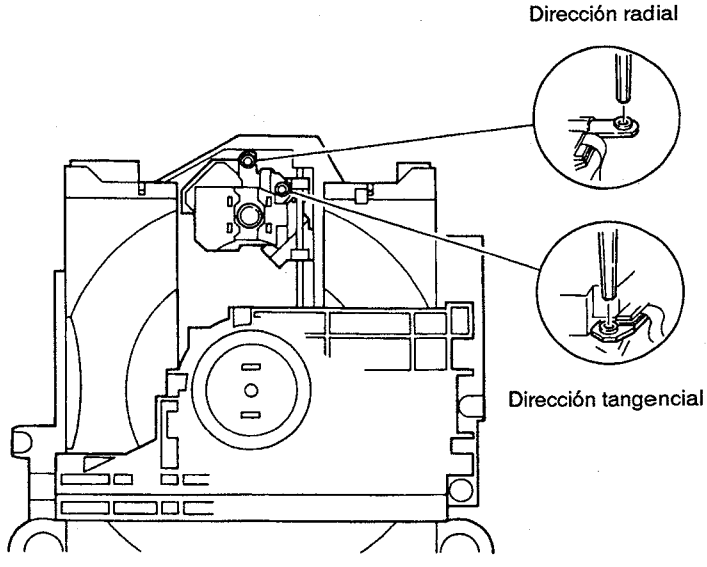


Figura 4



Lugares de Ajuste

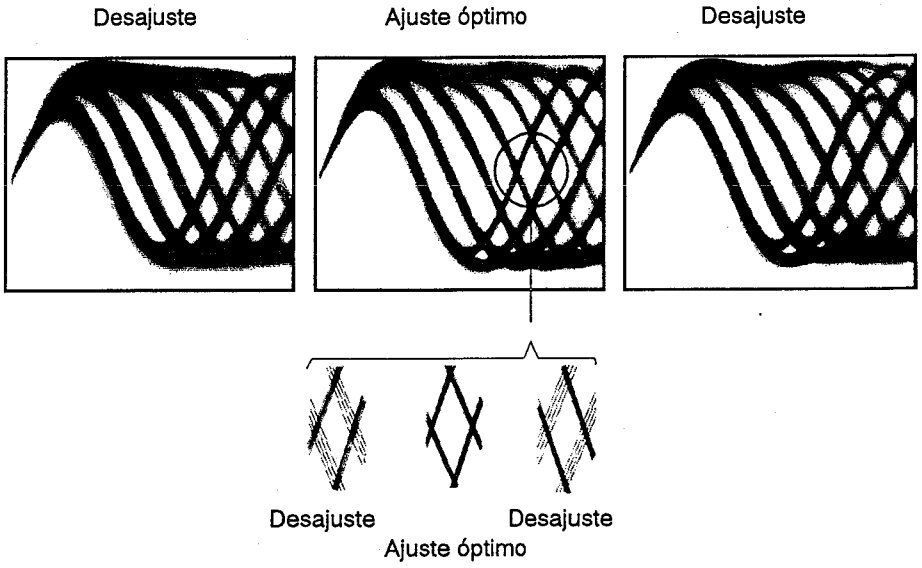


Figura 5 Patron Optico

5. Ajuste del nivel de RF

● Objetivo ● Síntomas en caso de desajuste	Optimización de la amplitud de la señal de RF de reproducción La reproducción no se inicia o la búsqueda de canciones es imposible.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 1, (RF). [Ajustes] 50 mV/división 10 ms/división modo de CA	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR1 (potencia de láser) YEDS-7

[Procedimiento]

1. Mueva el captor hasta la mitad del disco (R = 35 mm) con la tecla MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| o REV |◀◀ / ◀◀, presione la tecla PROGRAM, depués la tecla PLAY/PAUSE ▶ / ▮▮, dos veces en dicho orden, a fin de cerrar los servos respectivos, y ponga el reproductor en el mode de reproducción.
2. Ajuste VR1 (potencia de láser) de forma que la amplitud de la señal de RF sea de 1,2 Vp-p ± 0,1 V.

6. Ajuste de la ganancia del bucle del servo de enfoque

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de enfoque La reproducción no se inicia o el actuador de enfoque produce ruido.		
● Conexión de los instrumentos de medición	Consulte la figura 6. [Ajustes] CH1 CH2 20 mV/división 5 mV/división Modo X-Ý	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR152 (FCS GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| o REV |◀◀ / ◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PROGRAM, y después la tecla PLAY/PAUSE ▶ / ▮▮, dos veces en dicho orden, a fin de cerrar los servos correspondientes y poner el reproductor en el modo de reproducción.
3. Ajuste VR152 (FCS GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

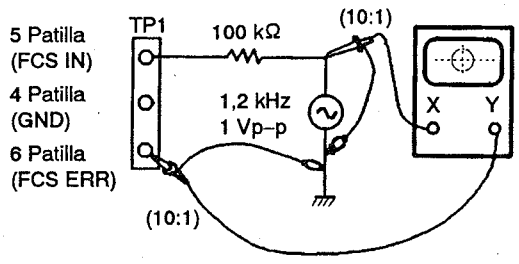
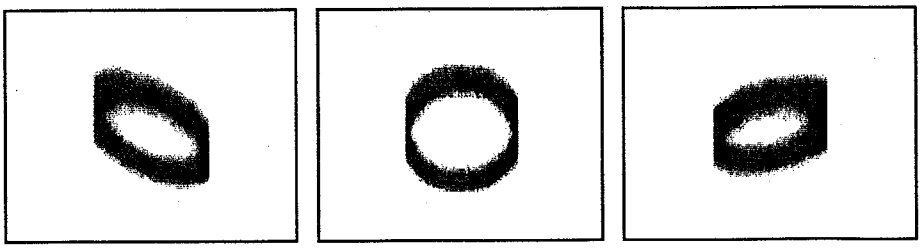


Figura 6

Ajuste de la ganancia de enfoque



Ganancia superior Ganancia óptima Ganancia inferior

7. Ajuste de la ganancia del bucle del servo de seguimiento

● Objetivo ● Síntomas en caso de desajuste	Optimización de la ganancia del bucle del servo de seguimiento La reproducción no se inicia, el actuador de enfoque produce ruido, o se saltan pistas.		
● Conexión de los instrumentos de medición	Consulte la figura 7. [Ajustes] CH1 CH2 50 mV/división 50 mV/división Modo X-Y	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, reproducción VR151 (TRK GAN) YEDS-7

[Procedimiento]

1. Ajuste la salida del generador de AF a 1,2 kHz y 1 Vp-p.
2. Presione la tecla MANUAL/TRACK SEARCH FWD ▶▶ / ▶▶| o REV |◀◀ / ◀◀ para mover el captor hasta la mitad del disco (R = 35 mm), y después presione la tecla PROGRAM, y la tecla PLAY/PAUSE ▶ / ❚❚, dos veces en dicho orden, a fin de cerrar los servos respectivos y poner el reproductor en el modo de reproducción.
3. Ajuste VR151 (TRK GAN) hasta que la forma de onda de Lissajous sea simétrica alrededor del eje X y el eje Y.

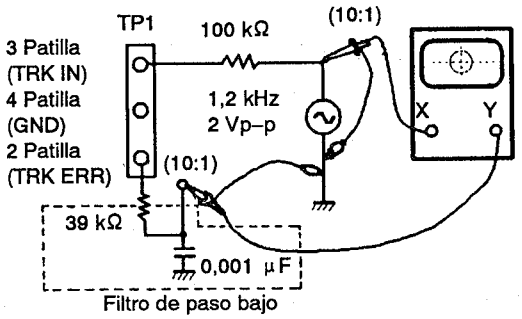
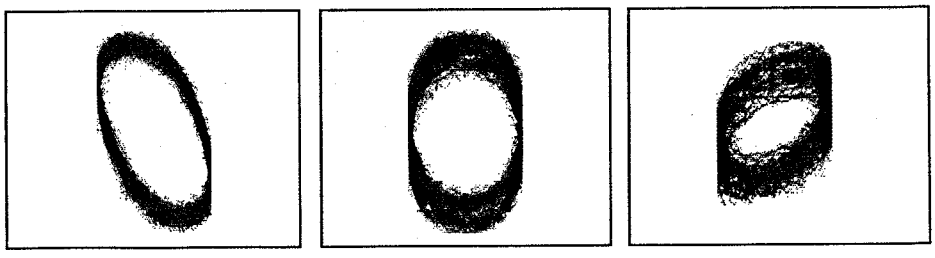


Figura 7

Ajuste de la ganancia de seguimiento



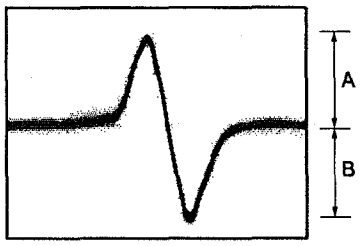
Ganancia superior Ganancia óptima Ganancia inferior

8. Verificación de la señal de error de enfoque (curva S de enfoque)

● Objetivo ● Síntomas en caso de desajuste	Juzgar si el captor est'a bien o no observando la señal de error de enfoque. El captor se juzga por la amplitud de la señal de error de seguimiento (como se ha indicado en la sección sobre el ajuste del equilibrio de error de seguimiento) y la forma de onda de la señal de error de enfoque.		
● Conexión de los instrumentos de medición	Conecte el osciloscopio a TP1, patilla 6, (FCS ERR). [Ajustes] 100 mV/división 5 ms/división modo de CC	● Estado del reproductor ● Lugar de ajuste ● Disco	Modo de prueba, parada Ninguno YEDS-7

[Procedimiento]

1. Conecte TP1, patilla 5, a masa.
2. Coloque el disco.
3. Contemplando la pantalla del osciloscopio, presione la tecla PROGRAM y observe durante un momento la forma de onda de la figura 8. Verifique si la amplitud es de 2,5 Vp-p por lo menos y si la amplitud de las partes positiva y negativa son iguales. Como la forma de onda solamente sale durante un momento cuando se presiona la tecla PROGRAM, presione una y otra vez esta tecla hasta que logre comprobar la forma de onda.



A = B
A + B ≧ 2,5 Vp-p

Figura 8

[Juicio sobre el captor]

No juzgue el captor hasta haber finalizado correctamente todos los ajustes. En los casos siguientes es posible que haya algo erróneo en el captor.

1. La amplitud de la señal de error de seguimiento es extremadamente pequeña (menos de 2 Vp-p).
2. La amplitud de la señal de error de enfoque es extremadamente pequeña (menos de 2,5 Vp-p).
3. Las amplitudes de las partes positiva y negaiva de la señal de error de enfoque son extremadamente asimétricas (relación de 2:1 o superior).
4. La señal de RF es demasiado pequeña (menos de 0,8 Vp-p) y aunque se ajuste VR1 (potencia de láser), la señal de RF no puede aumentarse hasta el nivel estándar.

9. FOR PD–J500T/HBXJS, SD, PD–J400T/HEMXJS, HBXJS, SD AND HPW TYPES

CONTRAST OF MISCELLANEOUS PARTS

NOTES:
- Parts without part number cannot be supplied.
- The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
- Parts marked by "⊙" are not always kept in stock. Their delivery time may be longer than usual or they may be unavailable.

The PD–J500T/HBXJS, SD, PD–J400T/HEMXJS, HBXJS, SD and HPW types are the same as the PD–J500T/HEMXJS type with the exception of the following section.

Mark	Symbol & Description	Part No.						
		PD–J500T/ HEMXJS type	PD–J500T/ HBXJS type	PD–J500T/ SD type	PD–J400T/ HEMXJS type	PD–J400T/ HBXJS type	PD–J400T/ SD type	PD–J400T/ HPW type
⊙	Sub board assembly	PWX1195	PWX1195	PWX1197	PWX1195	PWX1195	PWX1197	PWX1196
	├Function board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply
	└Power board assembly	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply	Non supply
⚠	Power transformer (AC220/240V)	PTT1172	PTT1172	.....	PTT1172	PTT1172	.....	PTT1125
⚠	Power transformer (AC110/120–127/220/240V)	.....	.....	PTT1126	.....	.....	PTT1126	.....
⚠	Line voltage selector (AC110/120–127/220/240V)	.....	.....	PSB1002	.....	.....	PSB1002	.....
⚠	AC power cord	PDG1008	PDG1021	RDG1003	PDG1008	PDG1021	RDG1003	PDG1011
	Operating instructions (English/German/French/Italian/Dutch/ Swedish/Spanish/Portuguese)	PRE1155	.....	.....	PRE1155	.....	.....	.....
	Operating instructions (English)	.....	PRB1165	PRB1165	.....	PRB1165	PRB1165	PRB1165
	Operating instructions (Spanish)	.....	.....	PRC1042	.....	.....	PRC1042	.....
	Packing case	PHG1803	PHG1803	PHG1799	PHG1804	PHG1804	PHG1800	PHG1800
	Function panel	PNW2123	PNW2123	PNW2123	PNW2147	PNW2147	PNW2147	PNW2147
	Insulator assembly	RXA1448	RXA1448	RXA1448	RXA1277	RXA1277	RXA1277	RXA1277

For the schematic diagram and PCB connection diagrams of SD type, refer to "5. SCHEMATIC DIAGRAM" and "6. PCB CONNECTION DIAGRAMS".

FUNCTION BOARD ASSEMBLY

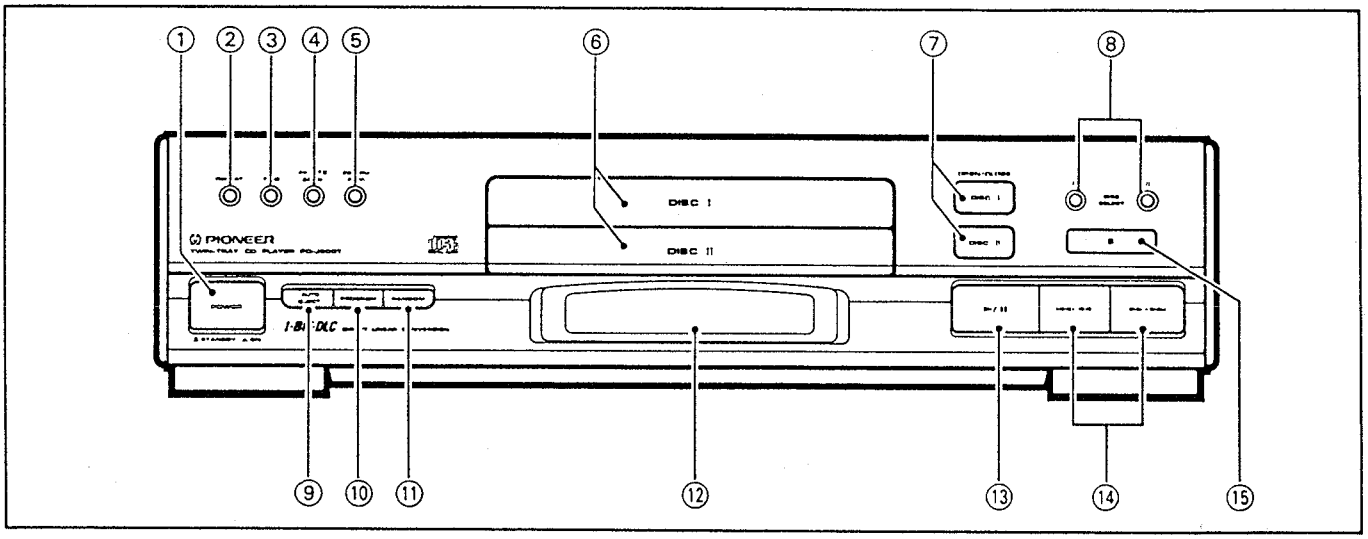
Function board assembly (PD–J500T/HEMXJS, HBXJS, PD–J400T/HEMXJS and HBXJS types) and function board assembly (PD–J500T/SD, PD–J400T/SD and HPW types) have the same construction except for the following:

Mark	Symbol & Description	Part No.		Remarks
		PD–J500T/HEMXJS, HBXJS, PD–J400T/HEMXJS and HBXJS types	PD–J500T/SD, PD–J400T/SD and HPW types	
	R701–R704	RD1/6PM100J	.....	

POWER BOARD ASSEMBLY

Although power board assembly of PD–J500T/HBXJS, SD, PD–J400T/HEMXJS, HBXJS, SD and HPW types are different in part number, they have the same service parts.

10. PANEL FACILITIES



FRONT PANEL

① POWER switch (STANDBY ON)

Press to turn power to the unit ON and STANDBY.

② REPEAT button

Press this button for repeat playback. Pressing the button once, twice, or three times will change the repeat mode from single track repeat, all tracks repeat, and repeat playback cancellation.

③ TIME button

This button selects the display mode of the indicator panel. Each time the button is pressed, the indication changes from TIME, REMAIN, to TOTAL in that order. (For details concerning the display contents, refer to the DISPLAY SECTION).

④ HI-LITE SCAN button

Every track of a CD is played back for 10 seconds, starting at a point one minute from the beginning of each song. To set a new starting time for HI-LITE SCAN, press the HI-LITE SCAN button at any desired point during playback of a track. This point will be set as the new starting time. After that, each track is played back for 10 seconds beginning at the new starting time.

⑤ COMPU PGM button

If this button is pressed for A.S.E.S. recording and the Manual/Track search buttons are used to designate the length (in minutes) of the recording tape, the CD player will automatically select and program the CD tracks to be recorded. The tracks will be selected for recording so that the empty portion remaining at the end of the tape will be as short as possible. For details regarding this function, consult the operating instructions for the amplifier used.

⑥ DISC (I, II) trays

These are where the discs are set. When power is switched ON and OPEN/CLOSE button is pressed, the tray opens to the front. To close the tray, press the OPEN/CLOSE button, or lightly push the tray opens to the front.

⑦ DISC I/DISC II OPEN/CLOSE buttons

Press when you wish to eject or load a disc. Each time the button is pressed, the tray is alternately opens and closes.

⑧ DISC SELECT button (I, II)

I: Use to select DISC I for playback or programming.
II: Use to select DISC II for playback or programming.

⑨ AUTO EJECT button

Press to perform auto eject playback.
When a disc is finished playing, the disc's disc tray will automatically open. The other disc tray will close and playback will start. By replacing discs, continuous playback can be maintained.

⑩ PROGRAM button

Use to program a sequence of tracks.

- Press this button after selecting a desired disc and track with the DISC SELECT and Track search buttons. Tracks will be added in the program in the order in which they are specified.

⑪ RANDOM PLAY button

Press to begin random playback.

⑫ Display

⑬ Play/Pause button (►/II)

When the CD player is paused or stopped, press to resume play or begin play.
If pressed during play, this temporarily interrupts play.

⑭ Manual/Track search buttons (|◄◄ • ◄◄, ►► • ►►|)

To perform track search in normal playback, programmed playback or PAUSE mode. You can advance to the next track or go back to the previous one by using the Manual/Track search buttons. The Fast forward or fast reverse function will be activated by holding down these buttons.

⑮ Stop button (■)

Press to stop playback. Press to clear a program. When pressed, the player goes into stop mode and all operations stop. When pressed during stop mode, the program stored in memory is cleared.